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ABSTRACT

This volume, intended for both professionals and the public, contains the ten papers and the ten edited transcripts of discussions from the National Institute on Drug Abuse workgroup. Each of the first five chapters presents two of the papers and discussion highlights selected by the authors. The papers included are: "Cannabis: Effects Upon Adolescent Motivation," by Sidney Cohen; "Incidence and Characteristics of Amotivational Syndrome, Including Associated Findings, Among Chronic Marijuana Users," by James Halikas, And Others; "Psychological Effects of Cannabis in Adolescence," by Doris H. Milman; "Some Clinical Comments on Chronic Marijuana Use in Adolescent Psychiatric Patients," by John E. Meeks; "The Relationship of Moderate Marijuana Use and Adolescent Behavior," by Donald Ian Macdonald; "The Effects of Marijuana on the Young," by Harold M. Voth; "Clinical Perspectives on the Toxicity of Marijuana: 1967-1981," by David E. Smith and Richard B. Seymour; "A Family Approach to Marijuana Use," by H. Charles Fishman; "Marijuana Abuse by Children and Teenagers: A Pediatrician's View," by Ingrid L. Lantner; and "Marijuana in the School: Clinical Observations and Needs," by Robert G. Niven. Chapter 6 contains selections from the workgroup's final discussions. Chapter 7 presents the summary and conclusions, discussing the idea of the family as the central focus in both prevention and management of marijuana-induced emotional and cognitive disorders in children; the necessity of raising the consciousness of health care professionals; the need for individual, familial, and national programs for prevention of marijuana use by adolescents, and the need for further, controlled clinical research into the nature of marijuana-induced brain syndromes. (AG)

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MARIJUANA AND YOUTH

Clinical Observations on Motivation and Learning

National Institute on Drug Abuse

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Foreword

During the 1970s, the use of illicit drugs by adolescents increased dramatically, and marijuana is by far the most frequently used illicit drug. Many parents, educators, and clinicians share a growing concern about serious psychological and developmental damage to many of the regular users, particularly as the age of onset of use has become progressively younger. In spite of this, the scientific literature on the adverse consequences of use by children and adolescents is very sparse. Many clinicians, therefore, are uncertain about just how serious such adverse consequences are to teenagers and have been somewhat ambiguous in making recommendations to the families for whom they care.

Fortunately, there are a number of clinicians, primarily pediatricians and psychiatrists, who have observed many teenage drug users and have developed some definite ideas about the effects of drugs, particularly marijuana. We thought it would be of value for them to present their views to each other and to discuss their observations to determine the areas of agreement. To this end, a workgroup was conducted at the National Institute on Drug Abuse on June 3, 1981. Ten papers were submitted, and the entire group discussed each of the papers. This volume includes the papers and edited transcripts of the discussions. Most of the participants found the meeting of great value and were pleased to learn that there was significant consensus in spite of significant disagreement. The areas of agreement and disagreement are masterfully summarized at the conclusion of the volume by Dr. Sidney Cohen, the chairman. Without covering all the points he made, I would like to mention a few.

1. All agreed that the consistent use of marijuana by preadolescents and adolescents can affect mental functioning adversely. Furthermore, the participants agreed on many features of a syndrome of adolescent drug use that includes decreases in academic performance, alienation from parents and prevailing cultural values, loss of motivation to succeed at conventional tasks, feelings of isolation, and often suspiciousness and paranoia. There was general agreement that this syndrome is by no means a rarity and indeed occurs frequently among teenagers.

2. The family should be a central focus in the prevention and in the management of cannabis-induced emotional and cognitive disorders of children.

3. Much discussion focused on why adolescents appear to be more vulnerable than adults to the psychic effects of marijuana, and it was agreed that more information about the effects of intoxicants at different developmental stages is of utmost importance.

4. Much attention was paid to the problem of remaining accurate in communication while not obscuring the forest for the trees. Our public health responsibilities are weighty, and too often the presentation of carefully qualified scientific findings results in a severe dilution of the impact of the message concerning the health hazards of marijuana.

It is particularly noteworthy that high school seniors perceive problems associated with marijuana use that correlate very well with the observations of the clinicians who participated in this workgroup. This conclusion is supported by the results of the 1979 and 1980 national surveys of high school seniors: Between 34 and 42 percent of daily marijuana users reported loss of energy (42.6 percent), deterioration of relationship with parents (38.6 percent), interference with ability to think clearly (37.3 percent), diminished interest in other activities (36.6 percent), diminished interest in other activities (36.6 percent), and poor performance at school (34.0 percent).

We hope this volume will be useful to professionals and the public. We believe it appears at a particularly significant time and that it complements the recently published Report on Adverse Health and Behavioral Consequences of Cannabis Use by the Addiction Research Foundation in Toronto and a study titled Marijuana and Health by the Institute of Medicine, National Academy of Sciences, assessing the health-related effects of marijuana use. Both of these emphasize the scientific literature, whereas this volume focuses on clinical observations. At this point in the development of our knowledge, it is best to plan action from an integrated data base--one that adds to the scientific literature the many thoughtful observations of parents, teachers, and clinicians.

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Introduction

Jack Durell, M.D.

During the past year or two, I have had the opportunity to talk with many parents who were concerned about their children's drug use. Frequently, I have been told, family physicians and pediatricians have not been as helpful as parents had hoped they would be in alerting them to the dangers of marijuana use. Indeed, in many cases, it was suggested that marijuana smoking is benign, a "stage kids go through." It is no wonder that physicians sometimes deliver an ambiguous message, since they generally must depend for information on the published scientific literature, in which there is very little useful data on the psychological consequences of marijuana use by adolescents. Worse, extrapolation from data reported in the literature sometimes leads to the false conclusion that marijuana use is safe. For example, several studies designed to seek evidence for the occurrence of an amotivational syndrome among marijuana users have failed to demonstrate its existence. It is sometimes concluded, therefore, that marijuana does not cause an amotivational syndrome. This conclusion is invalid even if limited to the age group studied, since there are a number of methodological problems that need to be considered. To further generalize those conclusions to younger adolescents is even less justified. The lack of good published studies on the consequence of marijuana use by children and adolescents makes it all the more important to attempt to refine and clarify knowledge based on clinical observations. It is my impression that clinicians who have the most experience with adolescent marijuana users are also those who have the most concern about the harmful consequences.

As we share our experiences with one another, we hope to clarify and sharpen our views and, perhaps, to reach a consensus on at least some aspects of the syndrome of adolescent marijuana abuse. I would like to suggest two areas for recurrent consideration:

1. To what extent are the effects of marijuana use specific to the age and developmental level of the user? More specifically, in what ways is the jeopardy to 12- to 14-year-old users different from the jeopardy to older adolescents (15 to 19 years)?

2. How can we most effectively transmit our shared clinical knowledge to our colleagues who care for children and families and to the lay public?

Chapter 1

Cannabis' Effects Upon Adolescent Motivation

Sidney Cohen, M.D.

Human motivation is a complexity of many psychoneuroendocrine factors. Innate drive hormonal secretion, the intrinsic wiring of the nervous system, acquired cultural and familial attitudes, and early learning goal-directed behaviors all contribute to the final drive setting of the organism. Motivation, of course, is not a precisely measurable constant. It varies within each person depending on mood, feelings of well-being, fatigue, and the positive or negative reinforcements acquired from one's motivated or hypomotivated behavior.

The desire to achieve is only a part of what we call motivation. Some expectancy of success must be present, although minimal possibilities of success do not deter the most highly motivated. Ego involvement in the goal is certainly an important variable.

Elemental drive states are readily observed throughout the animal kingdom. Survival, satiation of hunger and thirst, shelter, security, pleasure, and sexual gratification are remarkable only when these instinctual states are absent. More elaborate aspirations seem to depend upon the intricacy of the organization of the brain. Self-esteem and the esteem of others, creative activities, the need to communicate, the acquisition of knowledge, and action toward some communal goal are only a few of the satisfying qualities of human life that people strive for.

A variety of disorders of motivation can be observed. A compulsive overdriven state makes some people miserable. They can neither enjoy their efforts to achieve nor the achievements themselves. Even more common are the underachievers, those who never perform at a level approaching their potential. Personal loss, depression, failure, or a fear of failure may cause some people to refuse to compete and aspire. At times cultural or subcultural attitudes restrain susceptible young people from exerting themselves if the end appears meaningless or hopeless.

The imposition of drug effects can obviously shift motivational levels. Small amounts of caffeine or amphetamines are claimed to increase energy and goal-directed activity; CNS depressants tend to reduce drive states except in overanxious people. Intoxication from any source impairs such intricate cerebral functions as motivation, judgment, decisionmaking, and the integration of incoming sensory information with stored memorial data.

THE ROLE OF MARIJUANA

A major concern about cannabis is its presumed impact upon the motivational process, particularly upon youthful consumers of large amounts. Preadolescents and adolescents are particularly vulnerable to shifts in ambition and accomplishment. Goals are rarely definitively formulated, and an indecision concerning aspirations is not uncommon. Parents and teachers note phasic undulations of psychophysical drives. Frequent marijuana use seems to increase passivity, loss of interest, and social withdrawal in otherwise outgoing, active youngsters. Adults are also affected but usually to a lesser degree, perhaps because they are capable of continuing to perform established task patterns adequately. However, highly skilled acts like operating a vehicle under difficult conditions or absorbing complicated new information can suffer in anyone under the influence of cannabis.

This finding is by no means novel. The older literature (Indian Hemp Drug Commission 1893-1894, p. 3281; Benabud 1957; Miras 1969; Chopra and Chopra 1957) is replete with comments that heavy users of cannabis preparations manifest a dull lethargy and a loss of ambition and interest in work. Recent American writers with a favorable bias toward marijuana use have generally disparaged these older reports as inaccurate reporting by unsophisticated observers. They explain the social and cultural reduction in achievement and progress as the result of malnutrition, worms, or other causes of poor health in the indigenous population.

More recently, the demotivating potential of potent preparations of cannabis has received renewed attention because of the vast increase in the use of marijuana by young people in many parts of the world where it had never been a part of the dominant lifestyle. In 1968 the term "amotivational syndrome," in connection with sustained cannabis use, was employed independently by McGlothlin and West and by Smith. David Smith wrote: "Certain younger individuals who regularly use marijuana also develop what I have called the amotivational syndrome in that they lose the desire to work or compete." Two illustrative cases describe a lack of interest in sex, school, and other activities that remitted after a period of abstinence from cannabis.

McGlothlin and West described the syndrome as follows: "While systematic studies of the recent wave of young marijuana users are not yet available, clinical observations indicate that regular marijuana use may contribute to the development of more passive, inward turning, amotivational personality characteristics. For numerous middle class students, the progressive change from conforming, achievement-oriented behavior to a state of relaxed and careless drifting has followed their use of significant amounts of marijuana."

Both articles note the presence, especially in impressionable young persons, of apathy; loss of effectiveness; and a diminished capacity to carry out complex, long-term plans, endure frustrations, concentrate for long periods, follow routines, or successfully master new material. They remark on a loss of verbal facility and of future orientation. Magical thinking, an impression of great subjective creativity despite an actual loss of productivity and withdrawal from human contacts, is emphasized in the articles.

A number of health care professionals (Sharma 1975; Kolansky and Moore 1972; Campbell 1976) have subsequently provided similar reports on adolescents and young adults. Apathy and loss of goals are mentioned in connection with consistent marijuana use. It appears that almost every provider of health care to young people has seen one or a series of such poorly motivated young men and women who have dropped out, or who have had to drop out, of their schooling or job because of an inability to keep up.

ADOLESCENT DYSPHORIA OR CANNABIS?

An obvious question that must be answered is: Do the juvenile personality regressions represent the "normal" developmental perturbations and turmoils of growing up, or are they due to the pharmacologic action of chronic cannabis use? From a study of such cases it appears that both possibilities may occur. Some heavy smokers without any preexisting significant evidence of immaturity or inadequacy lose their drives, interests, and involvements. Should they be able to cease using for a few months, they gradually become more alert and recognize their blunted thinking in retrospect. A second group has been unwilling or unable to maintain their involvement in the sometimes stressful activities associated with growing up in America. They retreat from active participation and engagement in the vicissitudes of life. When they find marijuana, it serves to reinforce the withdrawal and make it more pleasant. Although the drug was secondary to their dropping out, it is not an incidental event. For them, marijuana retards the reemergence and reinvolvement in the psychological growing up process. Therefore, even in these instances of primary motivational failure, cannabis can substantially contribute to its perpetuation.

WHAT MAY CAUSE CANNABIS AMOTIVATION?

A number of hypotheses, none proved scientifically, are presented here for whatever heuristic value they may have.

1. Sedation Theory. A simple but not unlikely explanation of the amotivational syndrome may reside in the CNS depressant effect of cannabis. The repeated use of any CNS depressant consumed during much of the waking hours can blunt responsivity and induce motivational loss acutely and chronically. For example, persistent alcohol and sleeping pill use can accomplish this. THC is sufficiently sedative to induce decrements in alertness and vigor. Its cumulative property may add to the prolonged disinclination to perform.

2. Decadent Society Theory. Those who deny or minimize the amotivational potential of marijuana ascribe the loss of drive among present-day youths to the current state of societal directionlessness and disarray. To hold strong ambitions, beliefs, and aspirations now would be absurd, even untenable. According to this theory, the established allegiances, faiths, and collective bondings no longer exist, and there is nothing worth believing in or striving for.

   Actually, it could be just as easily argued that youths have rarely grown up in a world of greater hope and challenge than this one. Nevertheless, while our epoch is far from the worst of all possible worlds, if large numbers of youths happen to believe it is, then it is for them. Those devoid of hope, those who cannot perceive worthwhile goals, and those who believe that humanity is about to destroy itself obviously will be amotivated. Those unable to endure the frustrations of daily life are quite likely to drop out with or without marijuana. The so-called decadence of humanity is frequently an expressed rationalization for the personal inadequacies of the person unable to cope.

3. Retained THC Theory. Since THC (delta-9-tetrahydrocannabinol) with its long half-life cumulates in the body, particularly in fat and lipid cells when used frequently, it is believed that brain cells are impaired by its continuing presence. If this is true, "higher" mental processes like conation and motivation would be disturbed. Evidence for cumulation in the brain is not yet at hand, but this information should be forthcoming in the near future.

4. "Louder Music and Stronger Wine" Theory. The repetitive or incessant use of marijuana or other chemicals to stimulate the pleasure (reward) centers of the brain may eventually lead to a state refractory to ordinarily pleasurable sensations. Normally satisfying events such as play or enjoyable work no longer serve as sources of personal gratification. Therefore, little is left that is fun except more chemical stimulation of the reward centers. Some neurophysiologic basis for this hypothesis exists.

   As a corollary to this theory, if potent marijuana is consumed during the major portion of one's waking hours, the prolonged altered state of awareness produces shifts in previously held values and attitudes. Motivation tends to attenuate, and passivity, quietism, and withdrawal are frequent consequences.

5. Decreased Drive Hormone Theory. Several studies have shown decreased sex hormone levels associated with marijuana use in humans and animals. For testosterone this finding has not been confirmed invariably, and when a decrease has been shown, the reduction has been from normal to low-normal levels.

   Reports of decreases in luteinizing hormone have been more consistent. These hormones influence not only sexual drives, but also nonspecific drive states. There is a possibility that heavy users of cannabis are affected by the decline in circulating gonadal hormones, but this is far from proved.

6. Brain Cell Change Theory. Both depth electrode and microscopic examinations of specific limbic system structures have revealed long-lasting changes following a 6-month use of cannabis in primates (Heath 1976). The synaptic clefts were widened and filled with radio-opaque material. The cytoplasm and the nuclei of the neurons involved were altered. The nerve cell endings showed clumping of the storage vesicles. These changes were still obvious 8 months after the monkeys had stopped smoking the equivalent of three joints a day for 6 months. Could these microlesions in the centers for emotionality be the neuroanatomic substate of the amotivational syndrome?

7. Hemispheric Dominance Theory. Two studies in humans have demonstrated as an effect of cannabis an impairment of left hemispheric function, with a resulting relative dominance of right hemispheric activity in some people (Harshman et al. 1976). It is possible that the reduction of left hemispheric dominance may invoke fantasy-laden mentation. These mental shifts could promulgate motivational loss and regression to a more primitive type of autistic thinking.

8. Psychic Depression Theory. The possibility that a preexistent psychological depression or one intensified by large amounts of marijuana is the basis for the amotivational state has been suggested (Hogan et al. 1970). This assumption might hold for a subsample of marijuana-involved individuals but would not explain most of the instances of the syndrome.

ARGUMENTS AGAINST THE AMOTIVATIONAL SYNDROME

A number of people do not believe that motivational loss in connection with chronic marijuana use exists. They provide the following statements to support their contention.

School Surveys

A number of school surveys have shown no significant difference in performance between marijuana users and nonmarijuana users (Brill and Christie 1974; Kupfer et al. 1973). But in general such survey data suffer from at least two deficiencies. The quantity and quality of the cannabis smoked during the years the surveys were conducted were substantially less than at present. Daily users were infrequent 10 years ago; now they constitute about 10 percent of high school seniors. The second serious problem with such studies is that the most amotivated, dropouts from school, were not included, thereby invalidating the most critical indicator of amotivation.

Overseas Studies

Perhaps the best evidence that cannabis does not induce amotivation comes from anthropologic studies done during the past 10 years in Jamaica (Comitas 1976), Costa Rica (Carter and Doughty 1976), and Greece (Boulougouris et al. 1976).[1] In Jamaica, ganja is considered an energizer, and ganja breaks analogous to our coffee breaks are taken by farmers and laborers. In all three studies the subjects were illiterate or semiliterate field workers.

A number of defects in these interesting studies must be mentioned. The sample size was small, and sick people, the very group that would have been the most important to study, were excluded. The Costa Rican investigation seems to be the most flawed. From the information provided, it seems that the cannabis group changed jobs more frequently, had more part-time than full-time jobs, and had longer periods of unemployment. They had fewer pay raises and promotions and were more likely to indulge in nonlegal activities than the controls. School problems were more frequent and delinquent activities more numerous among the ganja sample. Despite these obvious social deviances, the authors concluded that cannabis was not an amotivator, a tribute to their ability to confirm a preconceived notion.

In the Greek study, the author's own data indicate that the cannabis group had higher arrest and unemployment rates even when arrests for marijuana offenses were not included.

A possible explanation for the findings. Another piece of research tends to explain the findings and supports the belief that adolescent amotivation is a real problem (Soueif 1976). An interesting Egyptian report helps clarify the issues raised by the Greek, Costa Rican, and Jamaican investigations. A total of 1,054 hashish users were compared with 954 controls, all of whom were imprisoned in Cairo and rural jails. A battery of culture-appropriate tests of intelligence and other aspects of mental functioning was administered. The results clearly demonstrated that the illiterate, the rural, and the older subgroups had smaller test score deficits when the hashish and control groups were compared. On the other hand, literacy, urban residence, and youthfulness were associated with markedly lower scores in the cannabis sample as compared to the controls. These results may explain the nonsignificant findings between users and nonusers in the Jamaican, Costa Rican, and Greek studies since the subjects in these studies were unskilled rural laborers, farmers, and urban ghetto dwellers.

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[1] For a detailed analysis of these investigations, see S. Cohen's Cannabis: Impact on motivation, Part II. *Drug Abuse & Alcoholism Newsletter*, 10:1-4, 1981.

Apparently chronic cannabis use does not--or cannot--impair motivation and intellectual ability in populations with preexisting low skills or nonstimulating lifestyles. It will affect those who live in a complex society that demands precision thinking to achieve and survive. The increased impact of cannabis consumption on youths as contrasted to older users is also of interest, since these same conclusions have been reached on the basis of clinical studies in North America and Western Europe.

Another possible reason for the divergent explanations of the phenomenon has been suggested by Petersen (1979). The customary manner of smoking cannabis in this country is to inhale deeply and retain the smoke in the lungs as long as possible. This technique increases the efficiency of the extraction of THC from the smoke. In Jamaica, where the ganja is mixed with tobacco, the smoking procedure more resembles cigar smoking, meaning that there is little or no deep inhalation, and therefore less absorption of the cannabinoids.

Another reason why tests performed on laborers and farmers may not be applicable to those involved in complex lifestyles is evident. Boring work may, indeed, be done as well or better under the intoxicating influence of cannabis. More complicated work that includes the continuous processing of new information is evidently performed less efficiently, judging from what we know of cannabis's effects on memory, perception, thought, and the integration of sensory input.

RECENT REPORTS

The Canadian LeDain Commission report (1972) on cannabis confirmed the adverse impact of heavy drug use on performance, grades, and motivation. The Commission was unable to sort out the impact of cannabis from participation in those cultures that did not value academic success or activities such as planning, or rationality, or concern for the future.

The 1979 National Survey on Drug Abuse (Miller and Cisin) obtained opinions from young and old adults, many of whom smoked marijuana, about marijuana use. Between 61 and 78 percent believed that heavy use would diminish motivation.

Mellinger et al. (1976) have produced a series of papers indicating that the ability to stay in college, get good grades, and define occupational goals is affected by marijuana, with heavy users showing more impairment than those less involved.

Papers by Kolansky and Moore (1972) and by Kupfer et al. (1973) and others (National Institute on Drug Abuse 1980) remark upon slowed thinking, diminished concentration, and attenuated attention span among other intellectual difficulties.

SUMMARY

The impact of frequently consumed marijuana appears to diminish drive states and goal direction. The older literature and recent publications agree that adolescents are especially susceptible to passive withdrawn behavior following chronic cannabis use. A number of theories about what may cause cannabis amotivation are discussed, among these the Sedation Theory, which is characterized as a not unlikely explanation for the amotivational syndrome. According to this theory, marijuana's drive-diminishing ability results from a depressant effect on the central nervous system. Discrepancies found in certain overseas studies are also clarified.

More than the testimony of numerous teachers, parents, and health care personnel, we need a meticulous study of the motivational effects of cannabis upon the juvenile, adolescent, and young adult. Without these data we are in the same opinionated posture of proponents of the notion that marijuana is good for young people Therefore, a high-priority item is the impartial evaluation of large numbers of young people exposed to significant amounts of cannabis compared to their colleagues matched in all respects except in their abstinence from cannabis. Whatever our opinions, a well-designed and executed study will provide precise answers to this important question and will provide a foundation for a rational policy on cannabis.

REFERENCES

Benabud, A. Psychopathological aspects of the cannabis situation in Morocco. Statistical data for 1956. UN Bulletin on Narcotics, 9:1-16, 1957.

Boulougouris, J.C.; Liakos, A.; and Stefanis, C. Social traits of heavy hashish users and matched controls. Annals of the New York Academy of Sciences, 282:17-23, 1976.

Brill, N.O., and Christie, R.L. Marijuana use and psychosocial adaptation. Archives of General Psychiatry, 31:713-719, 1974.

Campbell, I. The amotivational syndrome and cannabis use with emphasis on the Canadian scene. Annals of the New York Academy of Sciences, 282:33-36, 1976.

Carter, W.E., and Doughty, P.L. Social and cultural aspects of cannabis use in Costa Rica. Annals of the New York Academy of Sciences, 282:2-16, 1976.

Chopra, I.C., and Chopra, R.N. The use of the cannabis drugs in India. UN Bulletin on Narcotics, 9:4-29, 1957.

Comitas, L. Cannabis and work in Jamaica. A refutation of the amotivational hypothesis. Annals of the New York Academy of Sciences, 282:24-32, 1976.

Harshman, R.A.; Crawford, H.J.; and Hecht, E. Marijuana cognitive style and lateralized hemispheric functions. In: Cohen, S., and Stillman, R.S., eds. The Therapeutic Potential of Marijuana. New York: Plenum, 1976.

Heath, R.G. Cannabis sativa derivatives: Effects on brain function in monkeys. In: Nahas, G.G., ed. Marijuana: Chemistry, Biochemistry and Cellular Effects. New York: Springer Verlag, 1976.

Hogan, R.; Mankin, D.; Conway, J.; and Fox, S.J. Personality correlates of undergraduate marijuana use. Journal of Consulting and Clinical Psychology, 35:58-63, 1970.

Indian Hemp Drug Commission. Marijuana. Report of the Indian Hemp Drug Commission, 1893-1894. Reprint. Silver Spring, Md.: Thomas Jefferson Publishing, 1969.

Kolansky, H., and Moore, W.T. Total effects of marijuana use. The Journal of the American Medical Association, 222:35-41, 1972.

Kupfer, D.J.; Detoe, T.; Koral, J.; and Fajans, P. A comment on the amotivational syndrome in marijuana smokers. American Journal of Psychiatry, 130:1319-1322, 1973.

LeDain, G.; Campbell, I.L.; Lehmann, H.B.; Stein, J.P.; Bertrand, M.A.; and Moore, J.J. Cannabis: A Report of the Commission of Inquiry Into the Non-Medical Use of Drugs. Catalogue No. H-21-530/4. Ottawa: Information Canada, 1972.

McGlothlin, W.H., and West, L.J. The marijuana problem. An overview. American Journal of Psychiatry, 125:1126-1134, 1968.

Mellinger, G.D.; Somers, R.H.; Davidson, S.T.; and Manheimer, D.I. The amotivational syndrome and the college student. Annals of the New York Academy of Sciences, 282:37-55, 1976.

Miller, J.D., and Cisin, I.H. Highlights From the National Survey on Drug Abuse: 1979. Rockville, Md.: National Institute on Drug Abuse, 1979.

Miras, C.J. Drugs and Youth. Springfield, Ill.: Thomas, 1969.

National Institute on Drug Abuse. Marijuana Research Findings: 1980, Petersen, R.C., ed. Research Monograph Series No. 31. DHHS Pub. No. (ADM)80-1001. Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off., 1980.

Sharma, B.P. Cannabis and its users in Nepal. British Journal of Psychology, 127:550-552, 1975.

Smith, D.E. The acute and chronic toxicity of marijuana. Journal of Psychedelic Drugs, 2(1):37-48, 1968.

Soueif, M.I. Differential association between chronic cannabis use and brain function deficits. Annals of the New York Academy of Sciences, 282:323-343, 1976.

Incidence and Characteristics of Amotivational Syndrome, Including Associated Findings, Among Chronic Marijuana Users

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INTRODUCTION

Amotivational syndrome among marijuana users has often been discussed in the literature since its characterization (McGlothlin and West 1968; Smith 1968). The most dramatic accounts of the disorder come from other cultures, e.g., Egypt (Warnock 1903) and Greece (Boulougouris et al. 1976), or from anecdotal, clinical observations (e.g., Kolansky and Moore 1971, 1972). Explanations of the phenomenon range from positing a specific physiological effect of marijuana on the nervous system (Malcolm 1976) to speculation that a certain constellation of personality variables predispose individuals to the syndrome, and that marijuana use is merely coincidental to it.

Interpretive problems exist in virtually every study of amotivational syndrome because it is impossible to establish antecedents once the syndrome has developed. Controlled experiments aimed at inducing the syndrome, for example, by administration of marijuana, have, in general, had negative results (Mellinger 1976).

The advantages of the present study are threefold: First, it gives an estimate of the incidence of amotivational syndrome in a population of chronic marijuana users. Second, the data for each subject have been collected twice, separated by a 6- to 8-year interval, providing the opportunity to search for antecedents and correlates to the syndrome. And third, the data base is very large and includes a broad range of personal, psychiatric, and drug history variables, as well as a retrospective description of each individual's early personality, behavior, and life events.

METHODOLOGY

In 1970, 100 regular marijuana users were given an extensive systematic interview (the index interview) regarding their substance use histories, personal and psychiatric backgrounds, and other relevant details. Six to eight years later all but three were reinterviewed. All subjects were white, about two-thirds were male, and their mean age at followup was 28. Details of the selection and interview process have been published elsewhere (Halikas 1974; Halikas and Rimmer 1974).

At followup a specific inquiry into amotivational syndrome was made. From an extensive literature review, all the characteristic features of the amotivational syndrome were summarized. Each subject was asked the following question based on the summary of the literature:

> Have you ever had a period when you weren't depressed or unhappy, but you just seemed to lose your motivation although you weren't particularly upset by that feeling? You may have felt no interest or desire to carry out your normal activities or responsibilities. Plans or goals that were at one time important to you seemed to have fallen by the wayside for no apparent reason and you had no plans or goals to really replace them. You may have been listless and at loose ends but you didn't seem to particularly care. You may have also experienced some of the following feelings or symptoms in a vague way. You may have had a feeling of increasing unsureness about yourself, felt that you were giving a decreased effort or half effort at work, felt you lacked drive, initiative or motivation. You have dropped out of school or quit work for no specific reason; or had no desire to work, compete or face a challenge. In general you felt apathetic and disinterested in your previous pursuits.

In the results section, those responding positively to the amotivational syndrome probe will be described in the context of the marijuana user population under study. Particular attention will be given to evidence for a temporal relationship between amotivational syndrome and marijuana use.

RESULTS

Incidence of Amotivational Syndrome

Of the 97 regular marijuana users at followup, 3 had experienced an amotivational syndrome separate from depressive illness (Am.) and 2 other users had noted it as part of a major depressive disorder (Am./D.). Of the Am.s, two were male and one was female. Both Am./D.s were female.

The three subjects who indicated a history of an amotivational episode separate from any depressive syndrome were asked to provide additional information about the amotivational experience. Subject A indicated that his marijuana consumption was the same as usual during these episodes. (See table 1.) He has experienced from five to nine amotivational episodes, the first at age 19, with the longest episode lasting between 2 to 3 months. Subject B, the other male, had experienced only one episode, at age 27, which lasted from 2 to 3 months, during which his marijuana consumption was increased. Subject C experienced her first episode at age 16, and had four ensuing episodes, the longest lasting 3 to 4 months. She reported increased marijuana consumption during the episodes.

Drug Use History

Marijuana use. All three Am.s were regular users at the time of the original interview and continued regular use at followup. Table 2 summarizes selected statistics dealing with the marijuana consumption of the total user group. Each Am. and Am./D. is represented on the figures by their subject code. There were no significant differences between the amotivated subjects and the other marijuana users in terms of their frequency of use at followup, the number of years they had been regular users by followup, or the age of their first marijuana use.

Polydrug use. All the amotivated subjects had used other illicit drugs besides marijuana by the time of the index interview. They did not differ significantly from the user population as a whole, however, in terms of the number of different illicit drugs tried by followup, choice of most frequent "other drug," or the number of times the most frequent other drug had been used (table 3).

Abuse characteristics. The two Am.s reporting multiple episodes of the syndrome (A,C) were among nine of the user population who were independently classified as "marijuana abusers." This outcome was above chance level (χ^2=12.15, df=2, p=.002). This classification was based on behavioral criteria set out by Weller and Halikas (1980) that state abusers manifest problems in each of three or four of the following life areas: adverse physiological and psychological drug effects, control problems, social and interpersonal problems, and adverse opinions of others.

TABLE 1. --Descriptions of amotivational episodes

Amotivated subject code		Sex	Age of onset	Number of episodes	Duration of longest episode	Amount of marijuana during episode
A	Am.[1]	M	19	5-9	2-3 mo.	Same
B	Am.	M	27	1	2-3 mo.	Increase
C	Am.	F	16	5	[illegible]-4 mo.	Increase
X	Am./D.[2]	F	25	1	< 3 mo.	Same
Z	Am./D.	F	22	3	< 3 mo.	None

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[1] Am.s had experienced an amotivational syndrome separate from depressive illness.

[2] Am./D.s had noted the amotivational syndrome as part of a depressive episode. Information for Am./D.s is derived from their history of depression and is not specific to their experience of amotivation.

TABLE 2.--Marijuana consumption of the total user group

	Percent of users	
Frequency of marijuana use at followup (times per week):		
< 1	48.0	(Z)[1]
1	9.0	(X)
2	7.0	
3	9.0	(C)
4	4.0	(A)
5+	23.0	(B)
Total	100.0	
Years of regular use at followup:		
≤ 2	23.0	
3-6	37.0	(B,X,Z)
7-9	31.0	(C,A)
10+	9.0	
Total	100.0	
Age at first marijuana use:		
≤ 16	18.5	(C)
17	9.0	(X)
18	25.0	(Z)
19	16.5	(A,B)
20-21	18.0	
22+	13.0	
Total	100.0	

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[1] Letters indicate subject codes; see table 1.

TABLE 3.--Polydrug consumption of the total user group

	Percent of users	
Number of drugs tried at followup:		
0	7.0	
1-2	10.5	
3-5	15.0	(X)[1]
6-10	22.0	(B)
11-20	23.0	(A)
21-30	10.5	(Z)
30+	12.0	(C)
Total	100.0	
Most frequent other drugs:		
None	7.0	
Hallucinogens	57.0	(B,C,X)
Stimulants	26.0	(A,Z)
Opiates	6.0	
Sedatives	4.0	
Total	100.0	
Number of times most frequent other drugs have been tried:		
0	10.0	
1	6.0	
2-5	7.5	
6-10	12.5	(C,X)
11-25	14.0	
26-100	21.0	(Z)
100+	29.0	(A,B)
Total	100.0	

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[1] Letters indicate subject codes; see table 1.

TABLE 4.--Psychiatric variables (in percent)

Group	Depression (probable or definite)		Alcoholism (probable or definite)		Sociopathy (probable or definite)		Any other psychiatric disorder
	Index	Followup	Index	Followup	Index	Followup	Followup
Am. (N=3)	33	33	0	33	0	33	67
Am./D. (N=2)	0	100	0	100	0	50	100
Others (N=92)	29	45	3	19	13	24	61

Psychiatric History

The Am.s did not differ significantly from the total user group in their incidence of depression, antisocial personality, alcohol abuse, or any other psychiatric disorders. However, both Am./D.s were diagnosed as probable or definite alcohol abusers by followup interview in addition to their diagnosis of major depressive disorder (table 4).

Early Personality

At the time of the index interview, subjects affirmed or rejected items in a list of potential descriptors of their pre-age 14 personality structure. Am.s described themselves as more "independent" ($p < .03$) and "disobedient" ($p < .01$) than the user group as a whole (table 5).

Eighteen items on the index interview dealt with aspects of childhood and adolescent (pre-age 18) socialization and adjustment. The Am.s did not differ significantly from the user group on any of these items, but they had a generally lower rate of report on positive items and higher rates of report for negative items (table 6).

TABLE 5.--Early personality descriptors (in percent)

Descriptor	Am. (N=3)	Am./D. (N=2)	Others (N=92)
Obedient	33	50	47
Anxious	67	0	26
Possessive	33	0	20
Loner	67	50	41
Friendly	100	50	62
Follower	33	50	32
Leader	33	0	27
Independent	100	100	44
Angry	33	0	14
Rebellious	0	0	20
Troublesome	0	0	13
Disobedient	67	0	13

TABLE 6.--Early socialization and adjustment (in percent)

	Am. (N=3)	Am./D. (N=2)	Others (N=92)
Positive factors:			
Happy grade school	33	100	73
Happy childhood	67	100	74
Good family	67	100	75
Good high school--academic	67	100	75
Good high school--social	100	50	67
Overall percent	67	90	73
Negative factors:			
Alienation or isolation	61	50	52
Police contact by 14	0	0	7
School discipline by 14	33	0	15
Psychiatric help by 14	0	0	3
Parental conflict--ages 14-18	33	50	26
Repeated a grade	33	0	4
Expelled or suspended	0	50	12
Taken out of school prior to completion	0	0	12
Antisocial--ages 14-18	33	50	20
Police contact--ages 14-18	33	0	18
Truant	0	0	17
Self-destructive behavior	33	0	24
Psychiatric help--ages 14-18	33	0	15
Overall percent	23	15	17

Physical Health Factors

All the Am.s rated their health as good to excellent at followup, but they had seen a physician more often than the other users ($p < .01$).

Effects of Marijuana

The Am.s' reaction to the drug marijuana was probed by examination of their responses on a checklist of 105 marijuana effects that they completed at index and at followup. Each item was rated as occurring "usually," "occasionally," or "once or never." At index, the Am.s had a higher incidence than the other users for the items "rapid heart beat" (p=.007), "headache" (p=.003), "irritability" (p=.04), and "less restful postintoxication sleep" (p=.0004). At followup, the Am.s had higher reports for the items "decreased sexual arousal" (p=.006), "more dreams" (p=.05), "irritability" (p=.02), "confusion or bewilderment" (p=.05), and "more self-confident" (p=.0025) (table 7).

A series of questions was posed to subjects at followup dealing specifically with the effects of marijuana on their sexual activity. A majority of the users reported that marijuana increased their desire for a familiar partner. By contrast, two of the Am.s reported that marijuana had no effect on their desire for a familiar partner (p=.007). In a separate question, Am.s were also less likely to attribute aphrodisiac properties to marijuana than were the other users (p=.05) (table 7).

In general, the Am./D.s shared the Am.s' pattern of response to marijuana. They, too, suffered from more adverse physiological reactions and sleep and sexual disturbances than did the user group as a whole. One of the Am./D.s developed a pronounced reaction to marijuana that included vomiting severe enough to cause her to cease marijuana use.

DISCUSSION

The picture of the amotivated subjects that emerges from these analyses is a complex yet coherent one. They are relatively undistinguished by their actual level of drug use and psychiatric or personality variables. They are distinguished by their tendency to abuse drugs, especially marijuana. Specifically, at followup two out of three Am.s manifested abuse problems with marijuana in at least three of these areas: adverse physiological and psychological effects, control problems, social and interpersonal problems, and adverse opinions of others. Interestingly, both the Am./D.s and one of the Am.s had abuse problems with alcohol at followup.

Related findings revealed the nature of the "adverse physiological and psychological effects of marijuana" experienced by the Am.s. These were somatic effects, sleep disorders, decreased sex drive, and cognitive and mood effects, all reminiscent of a depressionlike state.

Thurlow (1971) observed features of depression, though not the total clinical description of depression, in a group of five student marijuana and hallucinogen users who complained of decreased drive and motivation. These five were successfully treated with an antidepressant.

TABLE 7.--Effects of marijuana (in percent)

	Group	Once or never	Occasional	Usual
Index interview symptoms:				
Rapid heart beat (p=.007)	Am.		100 (A,B,C)[1]	
	Am./D.			100 (X,Z)
	Other users	41	44	15
Headache (p=.003)	Am.	67 (A,B)		33 (C)
	Am./D.	50 (Z)	50 (X)	
	Other users	70	29	1
Irritability (p=.04)	Am.		100 (A,B,C)	
	Am./D.	100 (X,Z)		
	Other users	64	36	
Less restful sleep (p=.0004)	Am.	33 (A)	67 (B,C)	
	Am./D.	50 (Z)		50 (X)
	Other users	83	15	2
Followup interview symptoms:				
Decreased sexual arousal (p=.006)	Am.	33 (B)	33 (C)	33 (A)
	Am./D.		100 (X,Z)	
	Other users	70	28	2
More dreams (p=.05)	Am.		100 (A,B,C)	
	Am./D.		100 (X,Z)	
	Other users	53	33	14
Irritability (p=.02)	Am.		100 (A,B,C)	
	Am./D.	100 (X,Z)		
	Other users	72	28	
Confusion or bewilderment (p=.05)	Am.	33 (B)	33 (A)	33 (C)
	Am./D.	50 (X)	50 (Z)	
	Other users	62	36	2
More self-confident (p=.0025)	Am.			100 (A,B,C)
	Am./D.	100 (X,Z)		
	Other users	23	55	22

		Increase	No change	Decrease
Effects on sex:				
Desire for familiar partner (p=.007)	Am.	33 (C)	67 (A,B)	
	Am./D.		50 (Z)	50 (X)
	Other users	68	30	2
Aphrodisiac (p=.05)	Am.	33 (A)	67 (B,C)	
	Am./D.		100 (X,Z)	
	Other users	75	25	

[1] Letters indicate subject codes; see table 1.

CONCLUSIONS

Given the present data and observations of Thurlow, the following hypothesis can be made:

1. Marijuana has a physiological effect on some chronic users that is similar to a depressive state. The effects include sexual and sleep disorders, headaches, tachycardia, and irritability, as well as transient diminished motivation.
2. The syndrome affects about 3 percent of regular users, and it is relatively unrelated to the length or frequency of their use.
3. Certain types of people may be more susceptible to the syndrome than others, especially those who abuse other drugs and alcohol as well.
4. The natural history of the amotivational syndrome in these chronic users appears to be benign and self-limited with spontaneous remission when untreated.

REFERENCES

Boulougouris, J.C.; Liakos, A.; and Stefanis, C. Social traits of heavy hashish users and matched controls. Annals of the New York Academy of Sciences, 282:17-23, 1976.

Halikas, J.A. Marijuana use and psychiatric illness. In: Miller, L.L., ed. Marijuana, Effects on Human Behavior. New York: Academic Press, 1974. Pp. 265-299.

Halikas, J.A., and Rimmer, J.D. Predictors of multiple drug abuse. Archives of General Psychiatry, 31:414-418, 1974.

Kolansky, H., and Moore, W.T. Toxic effects of chronic marijuana use. Journal of the American Medical Association, 222:35-41, 1972.

Kolansky, H., and Moore, W.T. Effects of marijuana on adolescents and young adults. Journal of the American Medical Association, 216:486-492, 1971.

Malcolm, A. The amotivational syndrome--an appraisal. Addictions, 23:29-49, 1976.

Mellinger, G.D.; Somers, R.H.; Davidson, S.T.; and Manheimer, D.I. The amotivational syndrome and the college student. Annals of the New York Academy of Sciences, 282:37-55, 1976.

McGlothlin, W.H., and West, L.J. The marijuana problem. An overview. American Journal of Psychiatry, 125:1126-1134, 1968.

Smith, D.E. The acute and chronic toxicity of marijuana. Journal of Psychedelic Drugs, 2:37-48, 1968.

Thurlow, H.J. On drive state and cannabis. Canadian Psychiatric Association Journal, 16:181-182, 1971.

Warnock, J. Insanity from hasheesh. Journal of Mental Science, 49:96-110, 1903.

Weller, R.A., and Halikas, J.A. Objective criteria for the diagnosis of marijuana abuse. Journal of Nervous and Mental Disease, 168:98-103, 1980.

Discussion Highlights: Cohen/Halikas et al.

Voth: I read your earlier paper, and I was troubled by it. I was equally troubled by the presentation in this paper because I think it has a major methodological error, the use of a self-administered questionnaire. One of the most pernicious effects of marijuana is the user's inability to recognize what is happening to himself or herself. Therefore, it comes as no surprise at all that these people would fail to recognize the amotivational syndrome. In your earlier paper,[2] you use the dependent variable mainly for the outcome of marijuana, to define samples, and to distinguish users and nonusers. What you should have done, in my opinion, was to have used two samples: nonusers compared with substantial users, that is, those who use marijuana three times a week or more. Then you should have made comparisons by using criteria to discern the effects of marijuana based on what generally is observed. What you did was use criteria generally applied to alcohol abusers. The underlying assumption is that alcohol and marijuana have similar effects. They may have common effects, but that's like assuming aspirin and digitalis have the same effects.

Halikas: On the first point, you are absolutely correct. These subjects were interviewed and asked about their perceptions about their lives. There is no objective yardstick, and we did not interview families, relatives, spouses, or paramours.

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[2] Weller, R.A., and Halikas, J. Objective criteria for the diagnosis of marijuana abuse. The Journal of Nervous and Mental Disease, 168(2):98-104, 1980.

It is a testimonial study and is limited by that factor. The definition of abuse that has evolved in the last 15 years and is clarified in DSM-III hinges on the use of an elective substance that causes problems in multiple areas of a person's life. This definition is now used for all areas of abuse: Cannabis or alcohol abuse hinges on problems in a person's life.

Voth: Yes, but you didn't use nonusers versus substantial users.

Halikas: Originally, we had a comparison group of 59 users. By the time of the followup study, many of them had become social or occasional users but were not part of the abuse question. We were looking to see what percentage of the chronic users became abusers.

Smith: My research findings substantiate the findings of Dr. Halikas's study. This is the type of study that needs to be conducted. Certainly, there are methodological problems, but to say that marijuana users are delusional and inaccurate self-reporters is an erroneous statement. There are marijuana users who have problems with self-assessment. However, others are precise in their self-assessment.

What I see more often in the amotivational group is a conflict with goals. There are great difficulties when the family has one goal for the child and the child has a completely different goal. In our sample, we used self-definition of various goals in an attempt to screen out external bias. Usually, the young persons felt that the daily use of marijuana seriously interfered with self-defined goals and the ability to carry them out. When they stopped using marijuana, their ability to function returned. One cannot combine clinical opinion and methodological debate and then suggest that marijuana users can't perceive what is happening in their reality.

Lantner: Many of my patients who smoke marijuana start using "speed" to cope with their constant tiredness and lack of motivation. The ones with a strong goal-oriented personality are usually able to maintain their school grades and extracurricular activities for a while. Some who notice the incompatibility of their marijuana use with their self-defined goals stop their drug use. However, most of them insist that cannabis use does not interfere with their health and activities. They notice the changes more readily in their peers. Some of the younger and more compulsive smokers develop the well-recognized "pot head" syndrome, and even then they will not accept the fact that they have changed. All of my patients who continue their habit have gradually compromised their original activities, lifestyle, and goals.

Macdonald: The main problem I have with Dr. Halikas's paper is the age of the people he has surveyed. The average age of his respondents was 28, and even counting back the 6 to 8 years that these young people were involved in the study leaves us with a population that is not truly adolescent. As a pediatrician, what I am seeing and what concerns me is the "laid back," amotivated adolescent with no real goals in life except being euphoric. As Dr. Milman says so well in her paper, preadolescent children are especially at risk because their thought processes and reactions to new situations have not developed fully. Goals in an adult sense are poorly established, if present at all.

Milman: One of the most critical issues is referred to by Dr. Durell in his introduction, namely, the differential impact depending upon age and stage of development. Loss of motivation and loss of goals may not be a striking feature in the 11- to 14-year-old group since these youngsters are not yet at a stage of having self-defined goals. Thus, their success or failure relative to what they think their goals are is difficult to measure. Adolescents are only just beginning to define themselves, to restructure their egos. Failure, then, must be measured by lack of progress in cognitive development, in defining goals, in individuation, and in heterosexual functioning and attachment. Failure at this stage is multifaceted and not simply loss of goals or of motivation.

Smith: Although I agree with the concept of developmental stages, I disagree that 11- and 12-year-olds don't have goals. They have different goals--for example, their goals may be social interaction with their peers.

Durell: Dr. Halikas, how were the 100 subjects selected?

Halikas: The original participants were selected by word of mouth from an unknown source. It started with three people who did not know each other and who had assessed the drug community in St. Louis. They began telling their drug-using friends of the study with money incentives. Then they called me and they brought in nonmarijuana-using friends as a comparison group; from this we had a chain of referrals that reached as many as 9 or 10 generations. They ranged from high school dropouts to graduate students to the working-class sector in the community.

Durell: Similarly, Dr. Smith, could you tell us more about your subjects, particularly their age range?

Smith: The age range in our marijuana study was from 14 to 38. The amotivational syndrome group included adolescents to early adults.

Halikas: I was trying to look at the amotivational syndrome and see if the depression associated with it is different or the same as depression. Early reports describe it as being depression in the marijuana-using group. However, some people have the syndrome without depression. This is the only prospective series currently underway in America. We hope to do a followup study in the early 1980s. At this point, we also hope to interview family and relatives, conduct physical examinations, and draw blood samples for analysis.

With reference to the decrease in hormone drive discussed by Dr. Cohen, we may be seeing a cycling that may be related to marijuana. We are really only seeing the tip of the iceberg with the amotivational syndrome, and we also need to be aware of the role of hormone activity in the amotivational syndrome.

Chapter 2

Psychological Effects of Cannabis in Adolescence

Doris H. Milman, M.D.

INTRODUCTION

The prevalence of nonmedical drug use among young people was first addressed in this country in the mid-1960s. Most of the studies of that period were undertaken by colleges and universities as a means of dealing with a problem new to undergraduate life (McGlothlin and Cohen 1965; Pearlman 1968; Imperi et al. 1968; Eells 1968; Hinckley et al. 1968; Anker et al. 1971). It was soon apparent that drug use was widespread and growing. Based upon student acceptance of drug use and a popular misperception of innocuousness, it was predicted that the age of initiation would continue to decline (Anker and Milman 1972; Milman 1972). Indeed, this has turned out to be the case (National Institute on Drug Abuse 1979a).

Cannabis is second only to alcohol as the most prevalent drug of abuse among young people (Anker et al. 1972). It began to gain acceptance among college students in the sixties, with a lifetime use prevalence reported variously as 12 percent (McGlothlin and Cohen 1965) to 39 percent (McGlothlin and Cohen 1965; Pearlman 1968; Imperi et al. 1968; Eells 1968; Hinckley et al. 1968; Anker et al. 1971), depending upon the time, the place, the sample, and the investigator who did the survey. Cannabis use by high school students in 1969 appeared to be significantly less than that of college students, about 12 percent according to our study in Brooklyn (Milman and Su 1973). The situation in the last decade indicates that the trend of the sixties continued through the seventies, with the percentage of high school seniors who had ever used cannabis rising year by year, from 47 percent in 1975 to 60 percent in 1979 (National Institute on Drug Abuse 1979b, p. 25). With respect to age of initiation, 14 percent of children below the ninth grade had used marijuana in 1979 compared with 6.5 percent in 1975 (National Institute on Drug Abuse 1979a, p. 54). Because of these trends of wider use and use at a younger age, the deleterious effects of cannabis take on an overriding significance.

In countries of the Eastern hemisphere where cannabis has been freely used for centuries, its deleterious effects are well known, the Indian literature having documented the existence of a cannabis psychosis early in this century (Nahas and Paton 1979).[1] Little formal research was done, however, on a drug whose psychotogenic effects were accepted as a given and whose use was confined to adult males in only the most ignorant and impoverished sector.

With use by educated groups, by women, and by increasingly younger youths and children, there has been a concerted effort to refine our knowledge of cannabis effects by means of modern research methods. The literature is accumulating detailing a host of physiological effects on the pulmonary, endocrine, reproductive, and immune systems, as well as the central nervous system (Nahas and Paton 1979). With respect to effects on children, adolescents, and adult females, however, no systematic or controlled studies have been done because of ethical constraints and common sense. Thus, research on cannabis is limited to healthy adult male volunteers. For the rest, we must depend upon extrapolation, incidental experience, or painstaking casefinding and clinical observation. Unfortunately, anecdotal material and clinical observation have lost status as research instruments, their yield regarded as inferior to the findings of controlled studies, despite the rich and varied insights that previous generations of medical scientists derived from thoughtful clinical observation.

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[1] Whether or not a cannabis psychosis exists is a matter of some debate. As is pointed out by Reese T. Jones (in the National Institute on Drug Abuse's Marijuana Research Findings: 1980, edited by Petersen, R.C., DHHS Pub. No. 80-1001, Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off., 1980), the descriptions of long-lasting cannabis psychosis come from cultures in the Middle East and Asia, where cannabis is used more frequently and in higher doses than in this country. Further, the presentation of data in clinical studies describing cannabis psychosis would not withstand rigorous scientific scrutiny. He also notes that a number of reports that find no evidence of links between cannabis use and cannabis psychosis have methodological problems, which makes it difficult to draw unequivocal conclusions about the psychosis. In the Seventh Annual Report to the U.S. Congress, the National Institute on Drug Abuse noted further that the descriptions of a specific cannabis psychosis that are found largely in the Eastern literature are difficult to interpret because a diagnosis of mental illness is partly dependent upon sociocultural factors; the diagnostic picture is frequently clouded by other drug use and earlier evidence of psychpathology not related to drugs. This report concludes that if a cannabis psychosis exists, it is apparently rare under conditions in this country (National Institute on Drug Abuse. Marijuana and Health. Seventh Annual Report to the U.S. Congress From the Secretary of Health, Education and Welfare 1977. Pub. No. (ADM) 79-700. Washington, D.C.: U.S. Dept. of Health, Education, and Welfare, 1979).--ED.

TABLE 1.--Type of drug used

Drug	Number using[1]
Marijuana	24
Alcohol	14
Amphetamines	8
LSD	8
Hashish	6
Barbiturates	6
Glue	3
Heroin	2
Diazepam (Valium)	2
Methaqualone (Quaalude)	2

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[1] Multiple use was exhibited by 23 users.

CLINICAL DATA

Data in this report are derived from 24 subjects seen in private psychiatric practice from 1960 through 1979. Drug use was the primary problem for these young people or appeared as a complicating problem in the course of treatment.

In sex distribution males predominated in a ratio of approximately 3 to 1 (17 males, 7 females), and the representation of social classes was consistent with a private referral practice. Seven were the sons and daughters of physicians. The intelligence of the group, as measured by IQ, was predominantly in the above-average and superior range.

The peak ages of induction into drug use were 14, 15, and 16. Girls, however, seemed to start their use at a slightly younger age than boys (median age 14 for girls, 15 for boys). Also, the youngest user in the series was an 11-year-old girl; the youngest boy, 13. No girl was older than 16 at the start, whereas two boys were 17 and two were 18.

The drug common to all users was marijuana (table 1), but only one user confined himself to this single drug. The rest used multiple drugs, although, with the exception of alcohol, these other drugs were used only occasionally or experimentally on a once or twice basis. Eight users used 2 drugs, and the remaining 15 subjects used from 3 to 6 drugs. In 20 cases, marijuana was the first drug used; in 4, alcohol was the first.

In 11 cases it was possible to make a pre-drug-use psychiatric diagnosis (table 2), based either on my own prior knowledge of the individual or on data from another prior clinical contact. In

TABLE 2.--Predrug use diagnosis for 11 patients

Major diagnostic category	
Adjustment disorder	2
Personality disorder	9
Personality traits[1]	
Passive-aggressive	5
Schizoid	4
Phobic	3
Anxious	3
Inadequate	3
Depressive	2

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[1] Patients exhibited multiple features; therefore, numbers exceed 11.

respect to personality traits and features, this group represented the full range that one might expect to encounter in a clinical sample of adolescents. Only 2 of the 11 exhibited depressive features and none was psychotic or borderline psychotic. Three subjects had no identifiable preexisting disorder or maladjustment. For the remaining 10, there was not enough information to reach any firm conclusion about prior adjustment. Prominent physical findings included sparse facial hair (five boys), physical immaturity, impotence (four boys), and obesity (one boy, two girls).

School failure following drug use, a change from a prior good to excellent school record, was noted in 18 patients. Of these, half dropped out of high school or college, the dropout occurrences being in sharp contrast to intellectual ability. Five had difficulties with the police for offenses including stealing books and automobiles, and dealing in drugs.

Psychological manifestations during the period of drug use included a broad range of symptomatology (table 3). The most frequent finding was sexual anxiety, manifested as a preoccupation, as fear and avoidance, as compulsive promiscuity, or as impotence. The second most frequent finding was a thought disorder, manifested in fragmented thinking, illogical thinking, and confusion. Homosexual anxiety was present in nine individuals (two girls, seven boys), sometimes defended against by panicky avoidance of the same sex, sometimes by compulsive heterosexual seeking, sometimes by homosexual experimentation for the purpose of "proving" or dispelling the fear. Impaired verbal facility was apparent not only to me but also to the subjects themselves, who complained that they were unable to express ideas or find words or hold the thread of their thought.

TABLE 3.--Psychological manifestations for 24 subjects during drug use

Sexual anxiety/confusion	14
Thought disorder (fragmentation, confusion, illogic)	11
Homosexual anxiety	9
Impaired verbal ability	7
Suicidal ideation	7
Flashback	4
Delusional	4

Suicidal ideation was a prominent finding, with overt gestures by one subject. A most significant fact is that only two subjects had a prior depressive history. Moreover, depressive symptoms, and in particular suicidal thinking, were reversed when cannabis use was even temporarily discontinued.

The patients and their parents were particularly frightened by the occurrence of flashbacks[2] and somatic and other delusions. These states evoked unbearable anxiety, fear, and agitation, requiring sedation with chlorpromazine. Flashbacks lasted up to 4 months after stopping the drug.

Postdrug diagnostic classification pointed to clinically significant, disabling psychopathology (table 4). The total of 11 instances of schizophrenia and borderline schizophrenic personality was extremely high in relation to the absence of these categories in the predrug state. Personality traits and features also included a new finding of paranoia in addition to an increased incidence of depressive features.

The outcome for this group of youths was evaluated after an interval of 2 to 15 years. Eleven were judged stabilized, including three who were drug free. Although stabilized and functional, their careers and/or academic achievement were well below their potential as judged by early promise, intelligence, and prior academic success. Five were psychiatrically unstable and marginally productive, requiring continued parental and therapeutic support. Three, two female and one male, were seriously impaired and required repeated hospitalization. The outcome was unknown among five subjects who migrated to other parts of the country or dropped out of treatment. There was one death; one of the two heroin users died at age 20 of hepatitis.

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[2] A flashback is a spontaneous involuntary recurrence of the feelings and perceptual state produced by the drug.--ED.

TABLE 4.--Post-drug-use diagnosis for 24 subjects

Major diagnostic category	
Personality disorder	10
Chronic schizophrenia	6
Borderline personality	5
Acute dissociative reaction	3
Personality traits[1]	
Depressive	9
Passive-aggressive	7
Paranoid	6
Schizoid	5
Inadequate	2
Hysterical	2
Impulsive	1

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[1] Patients exhibited multiple features; therefore, numbers exceed 24.

DISCUSSION

These cases demonstrate the psychological effects of cannabis that have been known since antiquity. The most obvious of these effects is, of course, the cannabis-induced psychotic reaction, with delusional symptoms, disorientation, hallucinations, paranoia, and feelings of depersonalization and derealization. The psychosis may present acutely or insidiously, may be transient and wholly reversible, or it may be prolonged and chronic. When chronic it is clinically indistinguishable from chronic psychosis of the schizophrenic or paranoid type (Ames 1958; Keeler 1967; Talbot and Teague 1969; Weil 1970; Stone 1973; Treffert 1978).

They also illustrate the full range of cognitive and emotional changes that have been reported. The most prominent cognitive effects are impaired recent memory and retrieval, attentional deficits, difficulties in central processing, altered time perception, visual distortions, and hallucinations (Dornbush et al. 1971; Melges et al. 1971; Abel 1973; Vashon et al. 1974; Dornbush 1974; Ross et al. 1977; Miller 1979). Among emotional effects are mood fluctuations including euphoria, dysphoria, listlessness, apathy, and depression (Miller 1979; Keeler 1968; Clark et al. 1970; Galanter et al. 1974; Janowsky et al. 1979). Other emotional responses include drowsiness, indolence, withdrawal, anxiety, and apprehension. Hallucinations, paranoid delusions, and feelings of depersonalization and derealization are not uncommon, and are seen in acute intoxicated states as well as in acute or chronic psychoses.

A consideration of the psychodynamics of adolescent development will provide insight into the nature of the disruptive effects on emotional equilibrium and intellectual striving. The dysphoric mood effects of cannabis are experienced principally as apathy and listlessness, dampening the normal efforts at mastery and achievement. The cognitive effects of impairment of memory, processing, and retrieval serve to augment the emotional effects of apathy and indifference. Thus, the normal goal-oriented, achievement-oriented stage is foreclosed both by lack of will and lack of capacity. Lack of achievement, in turn, leads to failure to reach one's ego ideal with consequent loss of self-esteem.

At ages 12, 13, and 14, corresponding to school grades 7, 8, and 9, during which initiation into marijuana use is proceeding at an increasingly rapid pace, developmental phenomena are in a far more dynamic phase than in childhood; hence the effects of disruption are more telling. From a Freudian and post-Freudian perspective, the young adolescent is beginning anew to separate from the family and assume a self-defined sense of identity (Freedman and Kaplan 1965). This process involves disengaging from childhood attachments, childhood ego ideals, and hitherto accepted parental values, and developing new relationships, ideals, and values. A greater or lesser degree of disorganization and disintegration necessarily occurs prior to restructuring and reintegrating at the new level. Necessarily, too, the process spans several years and absorbs vast amounts of the adolescent's energies. At a psychosexual level, sexuality, which has gone through oral, anal, and phallic stages and then been given a moratorium during latency, now emerges strongly, augmented by hormonal influences, in a specifically genital form. In the Erikson formulation, the stages of early and middle adolescence are concerned with establishment of a sense of identity, failure of which leads to confused and shifting identities, which Erikson calls ego diffusion (Erikson 1963). In Piaget's schema, these years mark a dramatic cognitive shift from concrete operations to what he calls formal operations (Ginsburg and Opper 1969). Another term for this latter process is abstract thinking, which is characterized by the ability to think in terms of possibility as well as present reality, to deal with multiple possibilities while holding a single factor constant, to combine possibilities, and to generate hypotheses. This capability to manipulate abstract ideas makes possible deductive reasoning, scientific experimentation, assimilation of new ideas, philosophizing, and political theorizing--in fact, the full range of adult forms of sophisticated thought. It is a process that begins in preadolescence, proceeds throughout adolescence, and involves a major cognitive structural reorganization.

Referring back to the psychological effects of cannabis, one can now address the specifics of its impact on adolescent developmental progression. Cognition, clearly, is highly vulnerable. The acquisition of skills and the mastery of new material, so important to the individual's self-esteem and academic progress, will be hampered by the drug. Moreover, since the critical transition must be bridged from concrete to formal operations, a drug that impairs thought processes will compromise that transition. A dramatic

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falling off in academic performance is the most objective evidence of the drug effect. Not only is the acquisition of new information impaired, but also the type of learning that requires abstract reasoning or weighing of alternatives. Academic incapacity, in turn, leads to lowered self-esteem and weakened ego structure. Abstract reasoning, the ability to think in reversible terms and to make moral judgments, plays an essential role in restructuring the superego and generating an independently determined value system. Failure to develop a serviceable value system can lead to serious social conflicts and dislocations.

The process of separation from parents, and of development of a new ego ideal and a new sense of identity, necessitates substitution of other attachments and affiliations. The youngster whose drug use renders him or her emotionally detached or apathetic has difficulty in developing sustained and supportive attachments and is prone to becoming self-involved and isolated. The failure to form meaningful new attachments may also delay or altogether inhibit the development of a stable sense of identity.

Another normal feature of the parental separation process and drive toward independence is oppositional or hostile behavior. When drug use places the adolescent at odds with parental standards, the drug behavior can become the focus of severe discord. The separation process then becomes overlaid with irreconcilable differences: The young person may interpret parental criticism as rejection and respond with withdrawal, narcissistic preoccupation, and regression. Alienated from parents and tenuously affiliated with his or her peer group, this adolescent is highly vulnerable to the development of psychopathology.

A major consequence of the alienation, ego diffusion, and superego weakness described above, augmented by drug-induced apathy, listlessness, and depression is an adolescent pathological development often referred to as the amotivational syndrome (Mellinger et al. 1976). In its most common form it is expressed as inability to pursue studies or work, inability to define or to make any commitment to life goals, and hedonistic pursuit of immediate gratification.

Strengthening of gender-appropriate psychosexual identification and achieving satisfying heterosexual attachment and functioning are the remaining tasks of adolescence and usually do not occur until the middle and late teen years. In young adolescents there is heightened sexual drive and heterosexual awareness, but acting out is usually limited to masturbation, sexual talk, fleeting attachments, and crushes. These tentative activities come into sharper focus in mid-adolescence in the form of varying degrees of sexual exploration and experimentation, and in temporary romantic attachments in which the beloved is idealized or is perceived as an extension of self. The goal is more one of self-gratification than sharing. In late adolescence, sexuality and emotional attachment become fused in a relationship of mutual concern, sharing, and intimacy. This last phase is a prelude to a mature, heterosexual, lasting adult attachment.

The cannabis effect can prove highly disruptive to this last developmental task. Not only does the weakened adolescent ego and tenuous sense of identity impair the establishment of a strong gender identity, but these failures, in turn, inhibit heterosexual attachment. One result can be a formless groping expressed either as promiscuity or shifting bisexuality. Another is withdrawal from any attempt at sexual fulfillment. The cannabis effect abets this withdrawal by inducing apathy and passivity. For some adolescents who are insecure or frightened of their sexual strivings, cannabis is employed for its effect in overcoming self-consciousness and inhibition or, alternatively, for dampening sexual drive. The most disruptive cannabis effect, however, is the inhibition of emotional bonding and commitment necessary for true intimacy.

The cases cited here are significant not only for the typicality of their drug responses but also because in their high intelligence these individuals represent a group whose potential was of the greatest individual and social value. The inhibition of learning, thought fragmentation, loss of fluency of verbal expression, alienation, lack of motivation and direction, depression and confusion, and the temporal relationship to drug use are findings that have been replicated countless times, as have the acute psychotic reactions and the chronic psychoses. The tendency to employ other drugs after the initial encounter with marijuana is also typical and often confounds the clinical picture, although in all of these instances marijuana was the most frequently used and, except for four cases, the first drug.

While these cases are typical, they raise and leave unanswered many questions. To what extent is the clinical picture determined by cannabis, to what extent determined by intrinsic adolescent instability, and to what extent determined by preexisting personality factors? What is the role of dosage, frequency, duration, and admixture of other drugs? Are all users equally vulnerable or are there certain personality types that are especially vulnerable? What factors determine reversibility? Is reversibility total or is the individual's potential permanently compromised? The answer to this last would appear to be in the affirmative. Finally, is the cannabis effect actually more deleterious to the adolescent than to the adult, or is it merely more apparent because in general adolescent behavior is more labile and extreme?

A high degree of sophistication will have to be applied to clinical research in cannabis to answer these questions. Casual and serendipitous observations will not suffice. Primary physicians must be enlisted to recognize the kinds of aberrant behavior associated with cannabis and to elicit a reliable drug history. The task should now be made easier by the availability of a relatively simple urinary test for cannabis. Large cohorts of comparable youths must be followed longitudinally, comparing the adult outcome for those with and without adolescent drug use, factoring in such variables as duration, frequency, dosage, and admixture of multiple drugs. Measures such as these can enhance our knowledge and provide valuable data for developing a public consensus and an appropriate public health policy.

REFERENCES

Abel, E.L. Marihuana and memory: acquisition or retrieval? Science, 173(4001B):1038-1040, 1973.

Ames, F. A clinical and metabolic study of acute intoxication with cannabis sativa and its role in the model psychosis. Journal of Mental Science, 104(437):972-999, 1958.

Anker, J.L., and Milman, D.H. Patterns of nonmedical drug usage among university students: student attitudes toward drug usage. In: Keup, W., ed. Drug Abuse--Current Concepts and Research. Springfield, Ill.: Thomas, 1972. Pp. 202-214.

Anker, J.L.; Milman, D.H.; Kahan, S.A.; and Valenti, C. Drug usage and related patterns of behavior in university students. Journal of the American College Health Association, 19(3):178-186, 1971.

Clark, L.D.; Hughes, R.; and Nakashima, E.N. Behavioral effects of marihuana: experimental studies. Archives of General Psychiatry, 23(2):193-203, 1970.

Dornbush, R.L. Marihuana and memory: effects of smoking on storage. Annals of the New York Academy of Sciences, 36(1):94-100, 1974.

Dornbush, R.L.; Fink, F.; and Freedman, A.J. Marihuana, memory and perception. American Journal of Psychiatry, 128(2):194-197, 1971.

Eells, K. Marihuana and LSD: a survey of one college campus. Journal of Consulting Psychology, 15(5):459-467, 1968.

Erikson, E.H. Childhood and Society. 2d ed. New York: Norton, 1963.

Ewens, G.F.W. Insanity following the use of Indian hemp. Indian Medical Gazette, 39:401-413, 1904.

Freedman, A.M., and Kaplan, H.I. Comprehensive Textbook of Psychiatry. Vol. II. 2d ed. Baltimore: Williams and Wilkins, 1965.

Galanter, M.; Stillman, R.; Wyatt, R.J.; Baugham, T.B.; Weingartner, H.; and Nurnberg, F.L. Marihuana and social behavior: a controlled study. Archives of General Psychiatry, 30(4):518-530, 1974.

Ginsburg, H., and Opper, S. Piaget's Theory of Intellectual Development. Englewood Cliffs, N.J.: Prentice-Hall, 1969.

Hinckley, R.G.; Messenheimer, M.G.; Bardon, E.J.; Pennington, M.H.; Dredge, T.E., Sr.; Dvorak, E.J.; and Rupprecht, P. Nonmedical drug use and the college student. *Journal of the American College Health Association*, 17(1):35-51, 1968.

Imperi, L.L.; Kleber, H.D.; and Davie, J.J. Use of hallucinogenic drugs on campus. *Journal of the American Medical Association*, 204(12):1021-1024, 1968.

Janowsky, D.S.; Clopton, C.L.; Leichner, P.P.; Abrams, A.A.; Judd, L.L.; and Pechnick, R. Interpersonal effects of marihuana: a model for the study of interpersonal psychopharmacology. *Archives of General Psychiatry*, 36(7):781-785, 1979.

Keeler, M.H. Adverse reactions to marihuana. *American Journal of Psychiatry*, 124(5):674-677, 1967.

Keeler, M.H. Marihuana induced hallucinations. *Diseases of the Nervous System*, 29(9):314-315, 1968.

McGlothlin, W.H., and Cohen, S. The use of drugs among college students. *American Journal of Psychiatry*, 122(5):572-576, 1965.

Melges, F.T.; Tinklenberg, J.R.; Hollister, L.E.; and Gillespie, H.K. Marihuana and the temporal span of awareness. *Archives of General Psychiatry*, 24(6):564-567, 1971.

Mellinger, G.D.; Somers, R.H.; Davidson, S.T.; and Manheimer, D.I. The amotivational syndrome and the college student. *Annals of the New York Academy of Sciences*, 282:37-55, 1976.

Miller, L.L. Cannabis and the brain with special reference to the limbic system. In: Nahas, G.G., and Paton, W.D.M., eds. *Marihuana: Biological Effects*. Elmsford, N.Y.: Pergamon Press, 1979. Pp. 540-547.

Milman, D.H. Multiple drug usage by children. *New York State Journal of Medicine*, 72(22):2793-2796, 1972.

Milman, D.H., and Su, W.H. Patterns of illicit drug and alcohol use among secondary school students. *Journal of Pediatrics*, 83(2):314-320, 1973.

Nahas, G.G., and Paton, W.D., eds. *Marihuana: Biological Effects*. Elmsford, N.Y.: Pergamon Press, 1979.

National Institute on Drug Abuse. *Drugs and the Class of '78: Behaviors, Attitudes, and Recent National Trends*, by Johnston, L.D.; Bachman, J.S.; and O'Malley, P.M. DHEW Pub. No. (ADM)79-877. Washington, D.C.: U.S. Dept. of Health, Education, and Welfare, 1979a.

National Institute on Drug Abuse. 1979 Highlights. Drugs and the Nation's High School Students. Five Year National Trends, by Johnston, L.D.; Bachman, J.G.; and O'Malley, P.M. DHHS Pub. No. (ADM)81-930. Washington, D.C.: U.S. Dept. of Health and Human Services, 1979b.

Pearlman, S. Drug use and experience in an urban college population. American Journal of Orthopsychiatry, 38(3):503-514, 1968.

Ross, A.M.; Kuehnle, J.C.; and Mendelson, J.H. Effects of marihuana on reaction time and short-term memory in human volunteers. Pharmacology, Biochemistry, and Behavior, 6(1):73-77, 1977.

Stone, M.H. Drug-related schizophrenic syndromes. International Journal of Psychiatry, 11(4):391-437, 1973.

Talbot, J.A., and Teague, J.W. Marihuana psychosis: acute toxic psychosis associated with the use of cannabis derivatives. Journal of the American Medical Association, 210(2):299-302, 1969.

Treffert, D.A. Marihuana use in schizophrenia: a clear hazard. American Journal of Psychiatry, 135(1):1213-1215, 1978.

Vachon, L.; Sulkowski, A.; and Rich, E. Marihuana effects on learning, attention, and time estimation. Psychopharmacologia, 39(1):1-11, 1974.

Weil, A.T. Adverse reactions to marihuana. New England Journal of Medicine, 282(18):997-1000, 1970.

Some Clinical Comments on Chronic Marijuana Use in Adolescent Psychiatric Patients

John E. Meeks, M.D.

There is a saying about all respectable town drunks that goes, "I never realized that Charlie drank until I saw him sober one day." Unfortunately, that insight can never occur to observers of the average adolescent dependent on marijuana. The problem is that if one smokes, even if twice a week, sobering up--in any total sense--never occurs.

This fact, along with others that I will discuss later, has led to a bizarre situation. Almost all clinicians who work with large numbers of adolescents have come to feel extremely concerned about the damaging impact of marijuana use, yet scientific proof and general public acceptance of its disabling influence accumulate at a frustratingly slow rate.

I have been working with adolescents for 20 years. Initially I adopted an extremely liberal attitude toward marijuana when it was the "new kick on the block." Like many people, I viewed it as simply another experimental drug of rebellion and psychic exploration appearing on the adolescent scene. I assumed it was of no more import than beer and, in fact, perhaps less physically dangerous than alcohol.

It is the tragic evidence of my patients that has gradually forced me to a very different viewpoint. That viewpoint could best be stated briefly as, "Marijuana is a dangerous drug, and especially so since one of its effects is to obscure the user's recognition of the deleterious impact."

Since I lack scientific proof and cannot actually expect that you will take my clinical observations totally on faith, I will offer as a substitute some effort at a coherent explanation of marijuana's destructive interaction with the adolescent period, in hopes that my position, while still not proven, will at least appear plausible. My comments do not supersede other observations that have been made in regard to all pleasurable addictions. The tendency to deny the negative impact of any behavior that produces even a small degree of euphoria or even a modicum of psychological comfort is widely recognized. However, there is even more to the picture when it comes to marijuana.

Part of the problem, in fact, is that marijuana is not a "killer weed." Its effects in the usual street dosage are mellow, and not obvious and dramatic, as, say, are those of acute alcohol intoxication. In fact, the intoxicated marijuana state is so diffuse and difficult to define that many have said that the drug effect is totally dependent on the "set" of the user. Although there is mounting evidence that this is not entirely the case, there is enough truth to the statement to reinforce the marijuana mythology that asserts that users have almost total ability to control behavior and to perform normally while under the influence of cannabis. In passing, it should be mentioned that this belief in the ability to outsmart "the straights" and to escape detection although intoxicated is at least partially maintained by the naivete of most of us adults who wouldn't recognize a stoned kid if he was carrying a candy bar in one hand and a bottle of eye drops in the other. Parenthetically, it is this interesting and somewhat curious desire to be intoxicated without having that fact recognized that interacts in some interesting way with the paranoid fear of detection that characterizes at least some regular marijuana users at some times. In any event, it is striking that most marijuana users--as long as they are actively using the drug--tend to view themselves as undamaged by the chemicals in grass. They are often joined in this denial by their parents, teachers, and other adults. Obvious evidences of irritability; altered consciousness; volatile moods; paranoid hostility; and impaired social, educational, and economic functioning are dismissed or minimized as "adolescent rebellion" or cultural protest. This is a transformation of reality that makes simple alchemy a snap by comparison.

Even though marijuana's approach is stealthy, we must still offer some explanation of why this oppressor is welcomed by the adolescent victim. Even when adolescents recognize that marijuana is causing them problems, they are often unwilling or unable to give up the drug. We recently surveyed a group of adolescents who were hospitalized for psychiatric and emotional difficulties. Sixty-seven youngsters were queried anonymously regarding their marijuana use. Forty-nine of them--nearly three-quarters--admitted to marijuana use. Of that group, 29 or about 60 percent of the users admitted daily use. Of the 49 users, 28 stated they recognized that they had problems that resulted from their marijuana use. Two-thirds of the youngsters who felt they had problems were daily users, but one-third said they used the drug weekly or occasionally. It was fascinating to note that many of the youngsters described damage to their memory, concentration, thinking ability, and their capacity to function in an educational setting. Other problems were mentioned, especially disruptions of family relationships and friendships. However, over half of the youngsters indicated that they probably would continue to use marijuana!

Why are they willing to be victims? The first reason is fairly obvious. The adolescent, because of peculiar developmental vulnerabilities, is an eager consumer of any nostrum that provides a sense of well-being and a comfortable position with the surrounding world. Adolescents are required during the developmental period to abandon most of the support systems of childhood. They literally can no longer feel good about themselves by reason of being "good children." This realistic need to become more expressive sexually and aggressively and to adapt to an always new and changing world requires psychological movement away from the parent and the values of the parent. Unfortunately, at the same time, the adolescent has little basis as yet for self-confidence based on a comfortable sense of personal competence derived from solid achievement. On the contrary, everything is in preparation for a threatening future. Anticipatory anxiety in vocational, social, and sexual performance areas rules the day. Self-esteem is hard to gain, easy to lose.

Marijuana is a destructive pseudosolution. Peers use it to achieve a higher, superior state of mind--or so they say. Adults are uninformed on the subject: One can outsmart them easily and gain instant superiority over the frighteningly competent competition. At the same time the adolescent insures mutual support from a large portion of the peer group by simply using the readily available drug. The euphoric state of intoxication adds a spurious sense of mastery and independence from other people and the anxiety over pressure to perform. The additional kick involved in the exciting use of an illegal drug, coupled with the financial freedom provided by dealing, is an almost unexpected, delicious byproduct. The whole package creates an artificial world in which the adolescent can feel that needs are met and problems are few or nonexistent.

Unfortunately, this apparent exit from adolescent anxiety is in fact a trap door leading to a well-greased slide that can be very long indeed for some youngsters. Obviously, those youngsters at greatest risk are the ones who have other reasons to doubt their basic competence. These reasons may be neurotic or may be the result of temperamental extremes, learning disability, or faulty socialization and teaching. The danger is also magnified with the younger adolescent who has, on the average, more reasons for anxiety and fewer reasons for confidence in his or her abilities in the real world.

It is important that we recognize honestly that the vast majority of adolescents who smoke marijuana do not become burnouts. Undue alarm, exaggeration of danger, and unrealistic propaganda can discredit the more moderate but very real dangers that exist. Unfortunately, once the syndrome is well established, it feeds upon itself, creating a hostile and rebellious attitude toward those who try to interfere with this highly valued substitute for genuine achievement. The oppositional posture and paranoid distrust required by the illegal behavior disrupts supportive and helping relationships with adults who might be useful in directing the maturation process. A growing sense of guilt and betrayal toward all other people, but especially family and other intimates, adds to the problem. These young people are running from an unpleasant and increasingly menacing inner reality, as well as from dangers posed by the requirements for increasing autonomy and coping ability imposed by external reality.

Treatment is still lagging in technique partially because we have been slow to recognize the importance of the illness. I hope that we can rectify this professional blindness. Community organizations have begun to attack the problems of promotion and supply. Marijuana is a menace. It is an insidious and sneaky tyrant that takes over the control of many adolescent lives in damaging ways that may be more permanent that we yet realize. It requires our best efforts at prevention and treatment.

If you don't believe me, listen to the youngsters, particularly those who have stopped smoking marijuana for several months. In retrospect, these young people realize that they have emerged from a dampening and confusing cloud into the clear sunlight of reality. Looking back, they can see the dangers we need to address.

Discussion Highlights: Milman/Meeks

Milman: Two babies recently born at Kings County Hospital in Brooklyn, N.Y., have come to the attention of a colleague of mine. These babies were seen to be abnormal in the newborn nursery and appeared to have the morphological features of the fetal alcohol syndrome. On close inquiry, however, both mothers absolutely denied any alcohol use. Each mother, moreover, volunteered the information that she had used marijuana prior to the pregnancy as well as daily or several times a week throughout the pregnancy. Both babies were small for gestational age and both had dysplastic facies. Both babies had tremors suggestive of a withdrawal state, and one had seizures. One baby was neurologically immature at age 2 months. Neither is older than 2 months at this time, so it is not yet possible to assess outcome.

Cohen: Do you want to raise the issue of a fetal cannabis syndrome?

Milman: Yes, I do. One baby had webbed neck, low-set ears, high-arched palate, downward slanted eyes, preacral dimple, and patent ductus arteriosus. The other baby had epicanthal folds, posteriorly rotated ears, and elongated philtrum with absent groove.

Cohen: We have seen no major symptoms like convulsions and delirium. What we have seen is nausea and irritability. If you want to call that withdrawal, then you can speak of physical dependence.

Niven: I am concerned by the equation of denial with the use of marijuana. I think this is an erroneous equation because one can see denial with the use of other drugs and also in situations in which drugs are not used. We have to be very careful in saying that marijuana users do not know what is happening to them individually as the result of their marijuana use, when in fact, they are usually unable to see what is happening to them because of the general psychological process of denial, which may have nothing to do with the pharmacologic effect of marijuana.

We can't totally rely on what kids say about their drug use, whether they are stoned or straight. They will sometimes lie about drug use when they are straight, and while they usually minimize the extent of their use, on occasion, they will significantly exaggerate the extent of drug use. This exaggeration can rarely be documented by observation or laboratory testing. We need to be cognizant of these factors when taking drug histories.

Smith: We need clarification on certain key issues. Physical withdrawal has to be documented in the lab at a higher dosage. It is important to clarify marijuana's specific effects. I agree with Dr. Niven that denial is not a marijuana-specific effect.

In the verbal presentation Dr. Meeks said, "If you don't believe me, listen to kids who have had a problem, particularly those who have stopped smoking for several months." This is an important distinction. There are a fair number of young people who have gotten into meditation or exercise and have stopped their use of marijuana. Drug use was a phase in their lives. They didn't have serious withdrawals and didn't describe an emerging from a cloud. Those who have a problem do experience what you describe. It's a terribly important differentiation.

Meeks: My experience is with people who have problems; otherwise, they would not be seeing me.

Smith: This is my experience also. The ones who come to me with marijuana dependency problems fit into this category. We have done interviews with a nonabuse population in our clinic setting or through our educational training project. There are a significant number who report that marijuana use is a phase in their lives and that the alternative is not treatment but some other phase.

Halikas: In regard to the "emerging from the cloud" issue, we see this in people leaving all sorts of problems: recovered alcoholics, ex-salt users, new vegetarians, people who no longer smoke cigarettes, and born-again Christians. Thus, this phenomenon is not limited to marijuana.

With regard to both populations, Dr. Milman, I am curious as to how you correlated the outcome with who they were originally, and what sorts of diagnoses you had on transition at that earlier stage. The people who ended up stable and productive came from one particular set of personality characteristics, and the ones who ended up in a poorer outcome group had different characteristics in adolescence. Generally, what we may be dealing with is a false causes effect.

Cohen: Dr. Milman, your sample had so many polydrug users, why are you attributing much of their disability to marijuana?

Milman: In response to Dr. Halikas's question about outcome relative to premorbid personality, it is true that those with a better prior adjustment generally had a better outcome, providing of course, that they gave up drug use. Conversely, those with the poorest outcome had a history of significant adjustment problems, beginning in childhood. The fact that prior emotional problems led to a more serious drug effect should not be taken as exonerating the drug. Rather, it points the way to a direction for future research. For example, who are the susceptible individuals and how they can be identified beforehand? What factors determine reversibility? Are the effects fully or only partially reversible? In response to Dr. Cohen's question about polydrug use, marijuana was the first drug used by 20 of the 24 in my sample. In the other four alcohol was the first drug and marijuana the second. In all cases marijuana was the preferred drug, the most frequently used, and the most abused drug.

Cohen: Were any other drugs as seriously abused?

Milman: In cases in which marijuana was not the first drug used, alcohol was. However, alcohol was not used excessively but was employed primarily to enhance the marijuana effect. Other drugs were used experimentally and sporadically but not regularly. Admittedly polydrug use confounds the issue somewhat.

Smith: We found that the amotivational syndrome related to heavy daily marijuana use versus amotivational syndrome with depression surfacing significantly when marijuana use stopped, has a quite different clinical followup. The pure amotivational syndrome group didn't get involved with polydrug abuse when they stopped using marijuana. One-half of my sample was an amotivational syndrome depression-surfacing group. They had a much higher probability of abusing other drugs than did the purely amotivational group.

Cohen: The cases of depression haven't been uniformly reported for all people who have amotivational syndrome. I believe in your instance the percentage was 2 out of 5. I suspect it is even lower. There's one paper by Hogan et al. (Personality correlates of undergraduate marijuana use. Journal of Consulting and Clinical Psychology, 35:38-63, 1970) that mentions only a small number of depressives among the larger number exhibiting amotivational syndrome.

Chapter 3

The Relationship of Moderate Marijuana Use and Adolescent Behavior

Donald Ian Macdonald, M.D.

There are two points I will make at the outset, and then I will answer affirmatively the question, "Does moderate marijuana use produce behavior problems in adolescents and compound those that exist prior to its use?"

First is my strong objection to the use of the word "moderate" in reference to any adolescent drug use. It implies an acceptance of the concept that a certain amount of mind alteration is all right. This widely accepted but unproved belief is an extension of the general hedonism in our society that says, "If it feels good, do it." For adolescents, use of any psychoactive agents, even prescribed (Roush et al. 1980), may be dangerous. With first use they cross a threshold. Their immaturity and lack of coping mechanisms make them extremely susceptible to infection with the progressive disease described here. The American Academy of Pediatrics in its recently revised marijuana statement concurs that any use may be dangerous (American Academy of Pediatrics 1980).

Second is my feeling that studies seeking to isolate the behavioral effects of marijuana ignore the reality of alcohol use. My studies (Macdonald 1980) and those of others have shown that well over 95 percent of marijuana-smoking youngsters drink alcohol. Effects on behavior are probably synergistic. This is not to say that such things as amotivation, short-term memory loss, and paranoia may not be more specifically marijuana related.

The use of psychoactive chemicals by children and adolescents leads to a clear-cut and easily recognizable syndrome of behavioral and emotional change. Regardless of the motive for experimenting with mind-altering drugs, once children begin to use drugs for producing good feelings at a time of stress, they are in trouble. As they become chemically dependent, as millions of our youngsters have, their disease progresses in a remarkably predictable downward path.

First described by Newton (Newton 1981; Macdonald, in press) at Straight, a St. Petersburg, Florida, adolescent drug treatment program, the syndrome may be divided into five stages of clinical progression.

Stage 0. The Call to Do Drugs

Because of the large numbers of our children involved with drugs (National Institute on Drug Abuse 1980) it is not incorrect to say that "doing drugs" has now become the norm for adolescents. Efforts at prevention, at treatment, and at decreasing recidivism rates must take into account the multitude of "do drugs" messages, law enforcement problems, and lack of awareness that exist in our society (table 1).

Based on the work of Donovan, Jessor, and Jessor (Donovan and Jessor 1978; Jessor and Jessor 1975; Jessor et al. 1980), Glenn (Glenn and Warner 1977) has neatly grouped the measurable characteristics that appear to be forerunners of adolescent drug use and other delinquent behavior. These weaknesses are relative in the sense that as societal pressures increase, more strength is needed to say "no." These pressures include among others those from a huge and highly profitable drug industry.

The deficiencies should be preventable with a new emphasis on childrearing that stresses acquisition of coping mechanisms--the skills and attitudes that might help adolescents resist the urge to experiment. Among other things, these children have a poor self-image and a feeling of not really fitting in with their families. They have a belief that control of their destinies is based more on luck than on their actions. Adult skills such as ability to effectively communicate with others, to defer gratification, and to adjust to new situations are often lacking. Pediatric well-child care of the 1980s must include a strong emphasis on building these attitudes and skills, which are increasingly found wanting.

Stage 1. Learning the Mood Swing

The use of alcohol or marijuana begins most often with a "friendly" gesture to share an exciting experience. The offer, most often made by a friend or sibling, is usually refused at first. Once accepted, the learning process begins. Both marijuana and alcohol are usually tried in this stage, and with practice a fairly good high can be achieved. Also learned are a new language, new hangouts, and new friendships. There may be little behavior change except for some moderate after-the-fact lying. The forces that pushed the child from stage 0 to stage 1 have not disappeared and are now augmented by a new-found way of reaching euphoria. Progression to fairly regular weekend use is common (table 2).

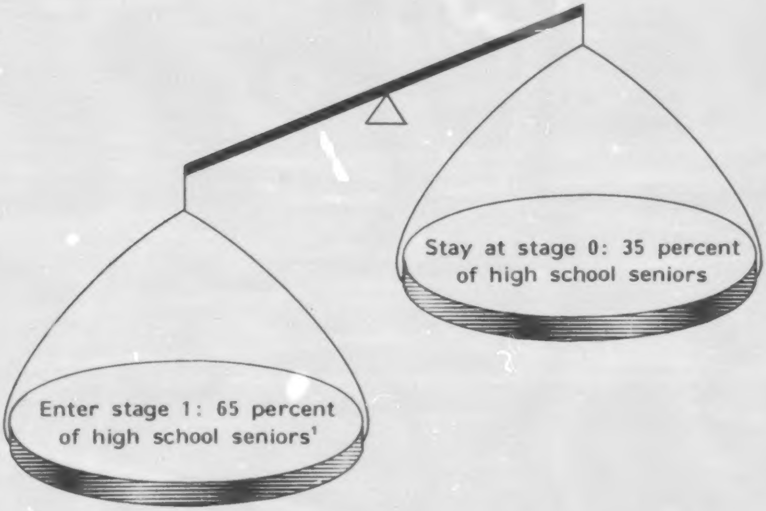
TABLE 1.--Stage 0: The call to do drugs

Pressures

- Hedonistic society
- Sales pitches, high profits--legal and illegal
- Negative role models
- Casual or ambivalent attitudes about drugs and alcohol
- Normal teenage attributes
  - Response to peer pressure
  - Curiosity
  - Liking excitement
  - Need to belong
  - Quick to rebel

Supports

- Laws and their enforcement
- Education
- Parents' attitudes and practices
  - Awareness
  - Caring communication and control
  - Good personal example
- The strength to say "no"
  - Strong coping mechanisms
  - Appropriate attitudes
  - Necessary life skills


Stay at stage 0: 35 percent of high school seniors
Enter stage 1: 65 percent of high school seniors[1]

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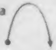
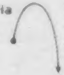
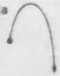
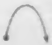
[1] About two out of every three seniors (65 percent) report illicit drug use at some time in their lives. Marijuana is the most widely used drug; 34 percent of the seniors reported use in the past month. An even greater percentage of high school seniors have used alcohol (93 percent); 72 percent have used alcohol in the past month (National Institute on Drug Abuse 1980).

TABLE 2.--Clinical stages of progressive drug abuse

Stage	Mood alteration	Feelings	Drugs	Sources	Behavior	Frequency
Stage 1. Learning the mood swing	Euphoria Normal Pain 	Feeling good Few consequences	Tobacco Marijuana Alcohol	Friends	Little detectable change Moderate "after the fact" lying	Progression to weekend use
Stage 2. Seeking the mood swing	Euphoria Normal Pain 	Excitement Early guilt	All above plus: Inhalants Hash oil "Uppers" "Downers" Prescription drugs	Buying	Drop extracurricular activities and hobbies Mixed friends (straight and drug) Dress changing Erratic school performance and skipping Unpredictable mood and attitude swings "Conning" behavior	Weekend use progressing to 4-5 times per week Some solo use
Stage 3. Preoccupation with the mood swing	Euphoria Normal Pain 	Euphoric highs Doubts including: ● Severe shame and guilt ● Depression ● Suicidal thoughts	All above plus: Mushrooms PCP LSD Cocaine	Selling	"Cool" appearance Straight friends dropped Family fights (verbal and physical) Stealing/police incidents Pathologic lying School failure, skipping, expulsion, jobs lost	Daily Frequent solo use
Stage 4. Using drugs to feel normal	Euphoria Normal Pain 	Chronic: ● Guilt ● Shame ● Remorse ● Depression	Any available	Any possible	Physical deterioration (weight loss, chronic cough) Severe mental deterioration (memory loss and flashbacks) Paranoia, volcanic anger and aggression School dropout Frequent overdosing	All day, every day

Stage 2. Seeking the Mood Swing

No longer content to wait for an offer to share a high, the user begins to beg or buy. The euphoria is so good that it seems a shame not to reach it more often, especially when there is stress. Adolescence is a time of great problems, anyway, and includes such things as acne, obesity, algebra, not making the team, and parents who "don't understand."

Behavior begins to change. Extracurricular activities may be dropped or participated in less actively (amotivation). Friendships change and begin to include some "cool" characters. Schoolwork may slip and there may be withdrawal from family activity and "unexplainable" mood swings. Harder drugs such as hash, prescription drugs, and inhalants are tried willingly. The relationship of drugs and sex cannot be ignored. Vulnerability to sexual advances, heterosexual and otherwise, is increased when one is seeking drugs or under their influence. Boys may use drugs to seduce girls and girls may do drugs to be accepted by boys.

Despite all the fun and excitement there are problems related to leading a dual life and the shame and guilt of using illicit substances. Hangovers and falling performance cause additional stress, which is now handled by seeking chemical euphoria--and the hook is in. Use increases to include weekday use (some solo). By the end of this stage, the hope of turning back without outside help is small, if any.

Stage 3. Preoccupation With the Mood Swing

This is the stage of the 9.1 percent of high school seniors who smoke marijuana daily (National Institute on Drug Abuse 1980). All activity is directed toward the next high. Behavior has deteriorated, and there are usually problems involving school, family, sex, and the law. Drugs cost money and selling is common. Depression, guilt, remorse, and suicidal thoughts are part of the pain. LSD, PCP, cocaine, and mushrooms are tried by most, but marijuana and alcohol remain the main chemicals.

The family is in disrepair. Parents, who were uneasy in stage 2, are now in real turmoil. Feelings of guilt and anger are common. One parent, often the mother, may lean toward guilt and believe her changing child's problems are due to lack of love and understanding. The other parent will often tend toward anger and feel the child needs more consistent discipline. Both parents tend to blame the other but secretly hope the behavior is just a phase the child is going through. They deny the basic problem. Until they understand the child's problem is use of drugs, efforts at help will fail. He or she must be drug free before they will see change.

Stage 4. The Burnout

Constantly in search of chemicals to ease inner pain, the child is out of school, worth little on the job, and unwanted by the family. Fatigue and cough are chronic. Flashbacks, overdosing, and amnesia are usual and are bound to get worse unless the child is helped.

THE ROLE OF THE PEDIATRICIAN

Diagnosis

With increasing awareness of the behavioral changes related to the stages of chemical dependency, the pediatrician will make the diagnosis more and more frequently. The diagnostic evaluation of the child will no longer just include lab tests such as blood counts and mono tests. A cough should no longer be evaluated without strong consideration being given to the possibility of marijuana smoking as an etiology. The pediatrician should also wonder about any child with behavior problems. If the child says he or she is not doing drugs, the physician should wonder why.

Treatment

The pediatrician must be aware of the importance of drug-free treatment and of the frequent need for at least temporary removal of the child from his or her environment.

Prevention

In addition to making children and their parents aware of the risks of drug use, the pediatrician must help families build strong defenses. Helping the family and child to build coping skills should be the pediatrician's concern from the prenatal visit on. Because of the numbers involved and the less than perfect success rates of even the best treatment programs, the answer has to be in prevention.

REFERENCES

American Academy of Pediatrics. What You Should Know About Marijuana. Pamphlet. Evanston, Ill.: the Academy, 1980.

Donovan, J.E., and Jessor, R. Adolescent problem drinking: psychological correlates in a national sample study. Journal of Studies on Alcohol, 39:1506, 1978.

Glenn, J.S., and Warner, J.W. The Developmental Approach to Preventing Problem Dependencies. Bethesda, Md.: Family Development Institute, 1977.

Jessor, R.; Chas, J.A.; and Donovan, J.E. Psychosocial correlates of marijuana use and problem drinking in a national sample of adolescents. American Journal of Public Health, 70:604, 1980.

Jessor, R., and Jessor, S.L. Adolescent development and the onset of drinking. Journal of Studies on Alcohol, 36:27, 1975.

Macdonald, D.I. "Survey of 104 Adolescents in Treatment for Chemical Dependency." Unpublished, 1980.

Macdonald, D.I. The clinical syndrome of adolescent drug abuse. In: Advances in Pediatrics, Vol. 28. Chicago: Year Book Medical Publishers, in press.

National Institute on Drug Abuse. Highlights From Student Drug Use in America 1975-80, by Johnston, L.D.; Bachman, J.G.; and O'Malley, P.M. DHHS Pub. No. (ADM)81-1066. Washington, D.C.: U.S. Dept. of Health and Human Services, 1980.

Newton, M.N. Gone Way Down. St. Petersburg, Fla.: Straight, Inc., 1981.

Roush, G.C.; Thompson, W.D.; and Berberian, R.M. Psychoactive medicinal and nonmedicinal drug use among high school students. Pediatrics, 66(5):709, 1980.

The Effects of Marijuana on the Young

Harold M. Voth, M.D.

Based on the observations I have made on the effects of marijuana, it is my opinion that this substance is harmful, especially to the young. I believe marijuana does lead to maladjustment and that it reinforces rebellious, negativistic behavior and lowers the individual's motivation for effective social adaptation. Furthermore, I am completely convinced that marijuana affects psychological processes and personality across a wide spectrum of behaviors and functions.

My interest in the effects of marijuana began approximately 10 years ago because of its apparent effects on both inpatient and outpatient psychiatric populations. Without any question in my own mind, patients use the substance to facilitate their repressive trends, that is, to assist them in their escape from the responsibilities and stresses of life and to calm their anxieties.

Periodic conversations with my psychiatrist colleagues provide support for my observations with only a few exceptions. Some of these exceptions may be related to the fact that some of these psychiatrists use marijuana themselves. One psychiatrist of national prominence who disclaims any harmful effects of marijuana has stated publicly that he smokes the substance several times weekly. For the most part, however, my colleagues agree that marijuana is harmful.

I have known quite a number of young people largely through their association with my three sons. I remember these children as bright and lively; then they began to change. Several of them underwent profound personality changes, failed at school, and some have fallen by the wayside. My sons have known five peers who were heavy drug users and who committed suicide. All of these young people began their drug-related regression by smoking marijuana.

I asked my two oldest sons, one of whom is in medical school and the other at a university, to observe their peers. They report that those who use marijuana regularly rarely stop. The medical student summarized, "With chronic usage the effects are lack of motivation, lack of direction, inability to concentrate, lack of tenacity, and difficulty directing attention. . . . The effects are generally not recognized by the user. . . . Personality changes are slow and insidious. . . . There is a deterioration in appearance, hostility toward authority, a trend toward uncooperativeness. . . . A way of life is established characterized by choice of music, friends, mannerisms, cliques. It is very hard for the individual to break away from the close-knit group of pot smokers, which seeks to enlist new members. Chronic use for years hooks the person into a life-style which is extremely hard to break."

The undergraduate observer states the following: "What I observed is a lack of drive and a washing out of the person's emotions. There is a loss of respect for so-called straight people and a general lack of caring for others. They deteriorate in about 6 months, don't realize it and have to be off the drug for several months before they clear up. Lack of goal directedness is the main effect on the older user. All users seem to live in a different kind of reality."

I have made more direct in-depth observations on the effects of marijuana through the psychoanalytic treatment of young adults who continued to use the drug during treatment. As a result of longitudinal observations, it is now clear that it is a mistake to try to do psychotherapy for the heavy user. Without any question marijuana has the effect of impairing the patient's motivation for achieving constructive change. At times, with the exercise of much willpower and bolstered by encouragement from the doctor, patients would abstain for varying periods of time. Improved alertness and greater motivation for treatment and for improvement of life generally were the result. However, this very improvement also generated adaptational anxiety caused by the mobilization of unconscious conflicts. If treatment goes well, they are resolved and the patient is relieved of the neurotic conflictual burdens. The marijuana smoker, however, like the alcoholic or any other drug-addicted individual, is prone to resuming smoking marijuana and regressing, rather than facing inner conflicts, resolving them, and maturing. In these patients, the unconscious meaning attached to the mental state that results from smoking marijuana is especially clear. Rather than facing life and mastering it, the anxiety and the prior use of marijuana open up the more easily taken regressive route.

There is no doubt in my mind that had these patients never been exposed to the anxiety-lulling effects of marijuana, they would have been more treatable. The few patients I have successfully treated were not extremely heavy users, and there were environmental resources available that could be used to isolate them from the drug. My psychotherapy supervisees report essentially the same findings. In brief, the patient is typically lacking in drive to change, is failing in life adjustment, is socially alienated, and so on. When treatment is successful, the changes in mental clarity and motivation are dramatic when the use of marijuana ceases.

The requisite steps for curing the chronic marijuana user, both inpatient and outpatient, in whom personality change has occurred, provide further evidence of the depth of the effects of the drug. Reason alone, which focuses on obvious personality and life adjustment effects, even acknowledged by the user, rarely produces positive results. Insight into the unconscious conflictual factors that led to the use of marijuana similarly will not bring about positive change. This latter point became completely clear to me after using what seemed to be very skillful and precise insight with my patients, only to find that positive responses to insight were fleeting at best. Occasionally a patient would abstain for a week or two, but eventually the urge to smoke, often combined with overt or subtle pressure from friends, prevailed and the patient lapsed into the old pattern.

In my experience there is only one certain way to be cured from marijuana smoking. The user must be totally isolated from the drug for a minimum of 3 months. Only after a period of sustained abstinence will the user become aware of the profound effects the drug has had, and at the same time become free of its addictive effects. The inability of the user to perceive himself or herself, or gain insight into what has happened to him or her over a span of time, is one of the truly pernicious and remarkable aspects of the effects of the drug. Talking rarely works; forthright decisive action by someone willing and able to take responsibility for the fate of the user is necessary. The chronic and heavy and probably even the moderate user rarely can take responsibility for himself or herself. How the person or persons exercise their responsibility to the user depends on the age of the user, his or her life circumstances, the severity of the retrogressive changes and deterioration of the user, and so on. I recommend sparing no effort whatsoever in achieving this objective.

TABLE 1.--Topeka, Kansas, teacher opinions

	High school	Middle school	Elementary school
Are you reasonably certain when one of your students is using drugs, including marijuana?	Yes 48 No 20	Yes 48 No 29	Yes 49 No 111
Does marijuana use impair the learning process?	Yes 65 No --	Yes 80 No 1	Yes 149 No 8
Does the marijuana-using student become estranged to some degree from his/her peers?	Yes 45 No 11	Yes 60 No 8	Yes 101 No 14
Does the presence of a marijuana-using student make your responsibilities as a teacher more difficult?	Yes 68 No 1	Yes 72 No 3	Yes 120 No 9
Does the presence of a marijuana-using student have some degree of disruptive effect on the educational process in the classroom?	Yes 57 No 6	Yes 72 No 4	Yes 96 No 11
Do you believe peer pressure is one of the reasons young people start using marijuana?	Yes 63 No 3	Yes 8 No --	Yes 184 No 3

In order to further study the effects of marijuana, and in a way that did not involve my own clinical observations, I conducted a survey of the elementary, middle school, and high school teachers of the Topeka school system; 428 questionnaires were returned. The opinions of these teachers are shown in table 1.

The opinions of these teachers strongly suggest that marijuana does impair social adaptation and learning. I have interviewed a dozen or so teachers, asking them to expand on their observations. All stated that they could tell when a student was using marijuana. Students become less attentive, they lose their motivation to learn and participate meaningfully in class, their performance slips, and some eventually drop out of school altogether. Usually their appearance changes for the worse; hair gets longer, they are less neat, and some adopt "far out" clothing styles. Overall, they were more alientated from the teacher. These observers spontaneously gave a few examples of bright, involved young persons who eventually became completely lost: "It was tragic to see this happen, but what could I do? Someone should have intervened."

I have received scores of personal communications by phone, letter, and direct conversation as a consequence of my public statements on the effects of marijuana. After appearing on a nationally broadcast TV program, I was deluged with letters and received many phone calls. Most were from distraught parents who described the progressive downhill course of their children as a consequence of marijuana use. Their children lost their motivation to succeed, grades fell, many dropped out of school, they were unreachable, and family life was severely disrupted. These communications were nearly always accompanied with a desperate plea for guidance and advice.

Former and current marijuana users have also contacted me in large numbers. Virtually all have said in one way or another, "You are right, I have lost my ambition, I can't think as clearly, I am losing out in life." Some say they have managed to stop using marijuana and have regained what they believe to be their old level of functioning. Others, however, state that they have been unable to regain their prior level of functioning. Many say they are unable to stop using marijuana. A few proclaim loudly that marijuana has never affected them. While there is no way to determine what these individuals might have become had they not used marijuana, I have been struck by their generally mediocre appearance and lack of enthusiasm. I am completely convinced that anyone will be harmed eventually if marijuana is used heavily for a prolonged period of time. I believe emotionally unstable and immature individuals are most vulnerable.

Based on these varied observations, I believe chronic marijuana use affects judgment, motivation, perception, cognition, and affect. In addition, the substance causes an overall deterioration of personality; it leads to an estrangement from the mainstream of life; it lowers performance in all areas; and it tends to lead to a social phenomenon in which users bond together into both loose or tightly bound subsocial groups. The effects on the user's family life are usually disruptive and frequently devastating.

In my opinion, the importation of and domestic production of marijuana in the United States constitutes a national crisis. I understand a bill is being or will be presented to Congress that authorizes the Federal Government to use the Armed Forces to augment existing law enforcement agencies. I believe such an all-out effort is entirely justified and should be used until the use of marijuana is stopped. Enormous harm is being done to millions of our fellow Americans, especially to the young, and therefore to our Nation.

Discussion Highlights: Macdonald/Voth

Smith: Are you saying that professionals who use drugs are not cognizant of the dangers of marijuana and other psychoactive drugs?

Voth: No. It is a well-known phenomenon in psychoanalytic work that countertransference won't let us see the real world, and it's also the same thing here. People who have used the substance for whatever reason tend to downplay its ill effects, perhaps due to the drug or to the psychological need that the drug serves.

Smith: Does the use of marijuana create a certain lifestyle or appearance?

Voth: Over time, there is an overall deterioration in personal appearance and hygiene.

Durell: It appears as if a fair amount of consensus developed this morning. We are participating in a good deal of discussion--even debate--but this is really about the limits of the consensus and thus may be obscuring the area of agreement. First of all, most seem to agree that there is a marijuana dependency syndrome. There is less agreement about whether this syndrome is specific to marijuana, or can be evidenced with the abuse of other drugs, and less agreement as to the degree that personality factors contribute to the syndrome. These are boundary questions that we cannot settle with the data on hand. We should not lose sight of the consistent clinical picture, including denial, distortion, paranoia, and alienation, that has been described as characterizing many of those adolescents who gravitate toward heavy marijuana use. We don't know what percentage of regular users develop this syndrome. Experience suggests a significantly higher percentage than the 3 percent of subjects with amotivational syndrome described by Dr. Halikas, which appears to be a different subsample of the population and represents a different syndrome than that described by the others. The observations reported by Dr. Milman appear particularly significant. What criteria did you use to separate your subsample from the entire samples of adolescent patients, Dr. Milman?

Milman: This subsample, drawn from all of my adolescent patients between 1960 and 1980, was selected solely on the basis that they were using marijuana. What distinguished this group from the rest of my adolescent patients was the high incidence of serious psychopathology, the high incidence of chronic psychosis, and something that was alluded to by Drs. Macdonald and Voth, namely, the difficulty of treating these patients. While on drugs they were virtually untreatable, and if they remained on drugs, they remained chronic patients. If they discontinued drug use, then they became just ordinary, difficult adolescent patients.

Durell: How large was the universe of patients from which they were selected? Second, were there other patients who used marijuana, but didn't exhibit this behavior pattern? Third, were there other patients in that group who showed similar characteristics but were not marijuana users?

Milman: In that 20-year period I saw as new patients about 222 individuals between the ages of 11 and 18. Thus, the drug users comprised about 11 percent of new adolescent patients. In answer to the question whether some users did not develop these behavioral and psychological characteristics, they all displayed the types of deviance we have been discussing, although there were individual differences in degree or in predominance of one form of behavior or another. For example, some were more openly hostile and oppositional, some more passive and reclusive. In regard to nonusers displaying these same characteristics, the answer is in the negative. Users differed from nonusers in many ways: their speech patterns were different, they were dysarthric,[1] their flow of speech was impaired and fragmented, their vocabulary was impoverished, and they had specific neurological changes in control and coordination. Also they were less accessible. The level of avoidance and denial was so high we couldn't reach them in any meaningful way. A question I would like to raise was why some discontinued marijuana. I don't understand what leads to discontinuance, either spontaneously or in response to therapy.

Lantner: With respect to Dr. Milman's question about why some teenagers stop marijuana use, I did some studies. Ten percent thought marijuana was harmful, and others stopped when they thought marijuana had long-range consequences. Many stopped when they became aware of social burnout factors in their subgroup and didn't want to become like that.

Fishman: There is no clinical evidence that the marijuana syndrome is an etiological factor vis a vis the amotivational syndrome. Dr. Halikas's study argues to the opposite. If only 3 percent manifest the amotivational syndrome, the other 97 percent are evidence to the contrary. In other words, Dr. Halikas's work is evidence that there is no correlation between use and this syndrome.

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[1] Dysarthria is distorted speech usually caused by disorders of the central nervous system and less often associated with disorders of the speech organs.

Halikas: This is a sample selection question. Marijuana users were chosen without regard to clinical contact or counseling. If, however, you start with people looking for help, you start with a different population. For instance, if you go to a jail and interview marijuana users, your conclusions lead you to believe all people who smoke marijuana are criminals. This is invalid. We need to make clear the two different population sources. We need to set up objective stages so we can track youngsters as different populations. It is important to see that this is not a homogeneous group because individuals start off from different levels of involvement. A young person who comes from a family with alcohol abuse is more susceptible to substance abuse. The earlier the onset, the fuller the course of involvement. Genetic factors also contribute to substance abuse. The young person who takes a drink before 15 becomes a high risk in terms of having problems with alcohol abuse.

Durell: I find the point that Dr. Fishman raised about etiological factors somewhat confusing. He appears to apply a simple linear cause-and-effect model to a problem that is clearly more complex and requires consideration of the interaction of multiple determinants.

It is difficult to communicate information about marijuana that is qualified by details about the effect of dosage level on harmful effects without appearing to be saying "It's okay to use marijuana as long as you don't overdo it." Let's not forget that most toxic substances are safe below a certain dosage level. Marijuana isn't unique in that property.

Voth: I know there are users who don't get into trouble because they don't use it that often. These individuals have strong personalities and are mature, stable people.

Cohen: That wasn't clear in your presentation.

Voth: I'm sure there are young people who don't get into trouble if they don't smoke too much marijuana. I don't claim there is a classic appearance syndrome, but there is, in my observation, a general deterioration. They don't look as sharp or act as sharp. The young person's psychological social effectiveness is impaired. We don't need marijuana.

Smith: Dr. Durell, how do you perceive the problem? I believe the best approach to youth is the truth. It concerns me when I hear others say you can't say something accurate and objective because it might encourage young people to use marijuana. I approach marijuana dependency the same way I would approach adolescent alcoholism. I insist on abstinence when I treat any substance abuse. However, if a treatment setting is clouded with misinformation, then it greatly impairs one's effectiveness of treatment. Misinformation is coming from promarijuana as well as antimarijuana people. This seriously compromises classic approaches to marijuana dependency, because we have to break through denial. Everything we said about denial can be related to alcoholism. One has to break through denial with objective approaches.

Durell: Speaking as a clinician engaged in one-to-one communication with an individual or a small group of family members, I would agree with you entirely. Under those conditions, you have the advantage of observing the person with whom you are communicating and obtaining feedback communication so that you can assess how the information is being understood and add corrective communications. Communicating the "truth" through a medium that does not allow for feedback results in varying degrees of misunderstanding. It is more difficult to deliver a complex message under those circumstances without increasing the likelihood of distortion. One has to be concerned with understanding how the communication is received. We cannot assume that a message more complete in its informational content would indeed communicate more accurately; quite the opposite might actually occur.

Lantner: What Dr. Smith is saying about truth troubles me. Psychoactive drugs, especially marijuana, impair young people's health. This includes maturation and development, both physical and emotional. I think as a preventive measure we need to stress this point. A large percentage of our schoolchildren and adults believe that marijuana is not harmful.

Petersen: This is not true. If you take recent surveys that have been done, a large percentage of young people do acknowledge that marijuana is harmful.

Lantner: I'm talking about younger children.

Cohen: Dr. Voth said that isolation for marijuana was the best treatment for marijuana use. How do you accomplish this?

Voth: You can't in this society. I will talk about individuals and the individual versus society in general. The problem is with young people who come from unstable families and broken families, who have great psychological vulnerability. They will get to anything that is obtainable, and this is marijuana. The family should take responsibility for protecting their children from marijuana. They can begin by telling them the facts, giving their children all the evidence they can provide. They should tell their children to get off the stuff and mean it. Parental authority is a fact of life. It can be used very lovingly. Young people need this and want it. I have seen terrible situations turn around when parents have said "enough is enough." It may not work in all instances, but it will work in some. Vulnerable youngsters can't save themselves. This is where parents come in.

Chapter 4

Clinical Perspectives on the Toxicity of Marijuana: 1967-1981

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INTRODUCTION

During the last 15 years we have been studying the toxic effects of marijuana from both clinical and epidemiological perspectives, using the treatment services at Haight Ashbury Free Medical Clinic and the Physician Consultation services of our Haight Ashbury Training and Education Project as a research base. We have seen public concern over the chronic effects of marijuana, particularly in young people, grow substantially. Unfortunately, the public information environment that surrounds the already difficult analysis of chronic toxicity of any drug, including marijuana, has tended more toward the political and ideological and away from the scientific and clinical. This irrational public information environment has confused both the physician and the public as they attempt to make an objective assessment of marijuana's toxicity. Very often, antimarijuana individuals and groups, using subjective criteria, overstate the dangers of marijuana use, and conversely, it is often the case even in the face of objective evidence demonstrating marijuana's toxicity, that promarijuana individuals and groups will understate the problem.

Our goal in this paper is to attempt clinical assessment of toxicity for the physician and client who are trying to assess and manage the acute and chronic toxic effects of marijuana in a therapeutic environment. This analysis emanates from clinical and epidemiological experience in the medical community and drug abuse treatment services of the Haight Ashbury Free Medical Clinic, as well as associated physician, family, and individual case consultation relative to the toxic effects of marijuana. In the period 1967 through 1981, the Haight Ashbury Free Medical Clinic has seen in excess of 500,000 client visits in its 6 sections (Smith and Luce 1971).

Although we maintain a large drug treatment program, many individuals come for general medical problems. Drug histories are taken on this general medical population as well, and we have found that in excess of 90 percent of the population of a mean age of approximately 21 years have used marijuana. These users range from single-dose experimenters to chronic daily users. We compared marijuana to the other psychoactive drugs with which we have similar clinical and epidemiological experience, ranging from alcohol to the stimulants, such as amphetamine and cocaine, to the sedatives, such as barbiturates and benzodiazepines, to the opiates, such as heroin. We found that marijuana, as a recreational drug, has a relatively low abuse potential compared to these other drugs of abuse (Schick et al. 1968).

Despite the fact that we have seen individuals use significant quantities of marijuana over long periods of time with minimal physical or psychological toxicity, there are two specific areas that have caused us growing concern over the years and that should receive greater clinical emphasis. In the assessment of marijuana toxicity relative to chronic physical damage, the daily heavy smoking of marijuana can, without question, produce a pulmonary irritant effect that leads to chronic bronchitis (Smith 1968; Smith and Mehl 1970). This is frequently seen in a clinical setting, although it is interesting that the dose response is quite variable, and some heavy users do not seem to have this pulmonary irritant effect (Smith and Seymour 1979). With the daily heavy inhalation of marijuana smoke and its associated hydrocarbon residue, the logical extension of such clinical experience is that such individuals are at risk for chronic pulmonary disease such as emphysema and lung cancer, similar to the risk to daily heavy cigarette smokers. Epidemiological studies equating heavy marijuana use with such chronic pulmonary disease have not been done, but it is our opinion that such a clinical correlation will evolve. The main question is the time-dose relationship necessary to produce chronic pulmonary toxicity.

Relative to the psychosocial toxicity of chronic marijuana use, we have seen over this 15-year period 30 adolescents with a mean age of 16 who have developed psychological toxicity on marijuana with subsequent psychosocial dysfunction. This dysfunction manifests itself primarily in school and family difficulties and a definite impairment in ability to learn. In addition, we have observed an impairment of motivation and on occasion a reduction in sexual desire with concomitant erectile failure. When these 30 individuals stopped smoking marijuana and stayed in long-term counseling, the effects were reversed. Both clinician and clients identified the chronic use of marijuana as a pharmacological factor in this complex psychosocial dysfunction, similar to what one would see in the early stages of chronic alcoholism in the adolescent where the impairment is reversible. It is important to note that while these clients did best in abstinence-oriented counseling programs initially, approximately 50 percent manifested an underlying depression following the cessation of the use of marijuana. Thus, it appears that a significant number of the heavy chronic users had self-medicated their underlying depression with marijuana. With any drug pattern, even those in which one can isolate a peer pattern of marijuana abuse separate from the usual pattern of polydrug abuse seen in adolescents, it is important to analyze the interrelationship of pharmacological, physical, psychological, and social-cultural variables. This, of course, is difficult in a clinical setting when one is attempting to isolate the marijuana variable and its relative contribution in this pattern of dysfunction. It is also interesting to note that no significant abstinence syndrome was seen (consistent with psychological dependency) other than some anxiety and desire to return to the use of marijuana, even after abrupt cessation.

Adolescence is not the only age group in which one sees an increasing incidence of the toxic effects of marijuana. We have seen a number of individuals over the age of 40 who, after a lifelong rejection of marijuana and attempts to dissuade young people from using the drug, have made a decision to use marijuana--often with their adolescent children. Interestingly, the adults' reactions to the drug are completely different from the adolescents', even in the same environment. The young individual has a positive psychological set toward the use of marijuana and describes a mild positive effect. The adult who has a negative psychological set toward the drug may have an acute anxiety or even paranoid reaction. The importance of psychological set and setting in individuals who have spent most of their lives believing that marijuana is a "killer weed" and then, for a variety of psychosocial reasons, decide to experiment with the drug, must be kept in mind in the clinical analysis of adverse reactions. This is even more important now that marijuana is being used therapeutically for the treatment of the nausea and vomiting induced by cancer chemotherapy and for the treatment of glaucoma. We have heard investigators describe older individuals' having dysphoric reactions to marijuana when the drug is taken in a therapeutic setting, whereas many younger individuals in the same study did not have dysphoric reactions at the same dose. Some investigators have attributed all of this to the pharmacological effects of marijuana, deciding that such dysphoric effects limit its therapeutic potential, thereby ignoring the potent effect of psychological set and setting in individuals that brings to the marijuana experience a negative attitude toward the drug.

It is also vitally important for both physicians and clients to analyze the acute and chronic toxicity of marijuana free from the confusing information environment that surrounds the drug. Certainly, we all have our opinions in this broad political, legal, and economic debate, but it is vitally important if one is to best serve the client to screen out these influences, to make an objective clinical assessment and diagnosis of acute marijuana toxicity based on objective criteria, and then to implement an appropriate treatment plan. Toward that end we will summarize our clinical findings relative to the acute chronic toxicity of marijuana, based on our clinical and epidemiological work with thousands of marijuana users since 1967.

ACUTE AND CHRONIC TOXICITY OF MARIJUANA

Toxic reactions to marijuana may be considered as any effects that result in physical or psychological damage, that are subjectively experienced as unpleasant by the user, or that produce significant interference with adequate social functioning (Smith and Mehl 1970; Smith 1968). In our clinical study, we have consistently excluded the relaxed euphoric effects described by users as "being high" or "being stoned."

In 1970, Smith and Mehl reported that "actual physical damage resulting from marijuana use is as yet unproved," and that still holds true in 1980. We suspect that, because marijuana in the United States is usually smoked, increased susceptibility to respiratory disease could be a chronic effect, as with tobacco smoking. However, during our research work in conjunction with the Center for Disease Control in Atlanta on the effects of paraquat, we did come in contact with long-term, heavy marijuana smokers who showed no evidence of such a proclivity. Death from marijuana overdose is still considered virtually impossible, although death by coma can be produced in animals by deliberate, massive overdose.

The unpleasant experiences that are induced by marijuana fall into two general categories--acute and chronic toxicity. Acute toxic reactions are usually of rapid onset and take place during a marijuana experience. These can include nausea, anxiety, paranoia, and disorientation. On the other hand, chronic toxic reactions are consequences that result from prolonged marijuana use. As chronic physical damage with marijuana has not been satisfactorily demonstrated, we are left with an impairment of social function in the form of an amotivational syndrome, i.e., a generalized lack of desire to compete in work or face challenges.

Acute Toxic Reactions

A variety of minor symptoms of marijuana use, such as reddening of the eyes, dryness of the mouth, excessive hunger, and sedation, should not be considered adverse reactions as defined above. Effects with a higher potential for acute toxic reactions are disorientation, confused states, short-term memory loss, and a variety of perceptual moods and conceptual alterations. When these effects are desired by the marijuana user, they cannot be considered toxic reactions. However, if they are interpreted as unpleasant, particularly if they produce concern or fear, they constitute acute toxic reactions.

Anxiety reactions and paranoid toxic psychoses may be so serious as to lead the user, or the user's friends and relatives, to seek professional help. This should not be confused, however, with situations in which parents seek help solely because their children are experimenting with marijuana. Neither rebellion with marijuana smoking as part of the symptomatology nor parental anxiety should be considered adverse marijuana reactions.

It should be noted that toxic reactions to any psychoactive drug depend on the nature and strength of the drug used, the personality and mood of the user, and the context in which the drug is used. Any instance of marijuana toxicity will involve all three factors, and proper diagnosis requires evaluation of all three variables. Further, the toxicity of marijuana is exacerbated when it is taken in combination with other drugs. The added effects of marijuana and alcohol, for example, substantially increase the danger of acute toxic reaction and overdose.

Drug-related factors. The amount of active ingredient and the quantity smoked, together with the tolerance of the user, determine the degree of intoxication. Acute adverse reactions are more likely when one is highly intoxicated than when only mildly high. This response, however, is modified by the user's tolerance level (Smith and Mehl 1970).

Potency of marijuana is usually predicated on the percentage of delta-9-tetrahydrocannabinol that it contains. However, the American Medical Association points out that it is uncertain whether delta-9-THC alone is responsible for marijuana's psychoactive effects. Biochemists have isolated and identified more than 400 compounds from the plant resin, of which 61 are known cannabinoids, such as cannabidiol and tetrahydrocannabidiolic acid.

Correspondingly complex is the issue of tolerance. Beginning users of marijuana generally require more marijuana than experienced users in order to get high, which may represent the psychosocial effects of learning how to get high. Some degree of confirmation of this is seen in increased incidence of placebo reactions in experienced users when compared to novices.

On the other hand, experienced users seem either to get high on very little or to require large quantities to get any effect. Regular heavy users who smoke more than 10 joints a day may be rare, but they do exist and maintain a mildly high state. Few marijuana users actually enjoy being a little high all the time. Most regular users prefer to limit their own use in order to enhance the quality of getting and being high. Some take periodic marijuana vacations ranging from days to months in order to be able to get high. Others never do indulge heavily but enjoy a "social puff" now and then.

The actions of heavy users seem to indicate either the presence of a systemic tolerance or a long-term retention of marijuana's long-acting active metabolites in the body, especially when smoked in volume. We see a situation in which experienced users indicate that they get high more easily after a period of nonuse than during periods of regular daily use. This suggests that the degree of tolerance probably depends on the use patterns of the occasional user as compared to those of the heavy user. The novice has a moderate degree of tolerance that may be based on lack of recognition of altered states of consciousness, or simply a lack of experience at relaxing into being high. Whatever the cause, tolerance seems to decrease and the experienced occasional user has a much easier time getting high than does the novice.

With the heavy user, the picture changes. Here, we see a "J" shaped progression with tolerance rising again for the heavy user, indicating that a very heavy user can tolerate more marijuana than a novice or an occasional user without ill effect. Conclusive research is needed on the action and retention of marijuana metabolites to determine the reasons for this high tolerance.

The occasional user can usually avoid the most common toxic reaction by titrating the dose, since most adverse reactions are dose related. When smoked, marijuana dosage is relatively easy to titrate and the experienced user is motivated to do so, because when one has overindulged, the pleasant feelings that are valued by the user can rapidly give way to feelings of nausea, dizziness, and a very heavy "drugged" feeling in which every motion seems an extreme effort. This toxic reaction is analogous to an alcohol overdose, i.e., getting too drunk. The main difference seems to be that generally there is no hangover with marijuana. This type of toxic reaction rarely comes to the attention of most health professionals, since it is generally managed by the user without professional help.

Psychological factors. The effect marijuana has on an individual depends to a large extent on personality structure, expectations, attitude toward marijuana, and mood at the time of use. The great variability of these factors makes the effects of marijuana somewhat unpredictable. This unpredictability has been a factor in the reluctance in this country to accept marijuana as a medicinal agent. These same psychological factors--personality, set, mood--are largely responsible for the more serious acute toxic reactions.

For example, marijuana can precipitate an acute psychotic reaction in a marginally adjusted or poorly organized personality. In such cases, the psychosis is characteristic of the personality structure of the user, not of the drug. The drug intoxication merely triggers the psychosis. This can happen with a variety of drugs, including LSD and PCP. Even with better organized personalities, cannabis can precipitate severe, though less profoundly disorganizing, psychological changes, particularly in the presence of threatening environmental stimuli. Intoxication may produce a keener awareness of existing stresses and may hinder the ability to maintain structural defenses. In both cases, problems can occur for persons who are quite familiar with the drug but who are caught in a confluence of various psychosocial stresses, threatening stimuli, or a higher dose of marijuana than the individual is used to.

Since marijuana use in the United States is illegal and most citizens have been exposed to strong warnings about its dangers, novices often experiment with marijuana in an emotionally charged situation. Although this has decreased to some extent through a general lightening of penalties for marijuana use in the 1970s, it can be the act of using the drug itself that creates a stressful situation. Inexperienced users may fear discovery and arrest with consequent loss of respect, loss of job, strained family relations, and possible incarceration. They may harbor secret fears that marijuana will produce physical damage, will make them lose control and do things they don't want to do, or will cause insanity. Such a strong negative set toward marijuana can, of itself, produce sufficient stress to create a panic state when the influence of the drug is felt. The altered mental state produced by the drug seems only to confirm the fears, and a full-blown anxiety reaction develops.

Even if a strong negative set is not present, the unexpected nature of marijuana and the fear of altered reality can be unsettling. Anxiety may result simply from a misunderstanding of the physical symptoms of marijuana intoxication. We have seen cases in which the mild tachycardia common with the early stages of marijuana intoxication was interpreted under increased sensory awareness as "about to have a heart attack," with a subsequent anxiety state. More commonly, the altered state of consciousness can be cause for alarm. The altered time sense may give a feeling of disorientation, and an increased awareness of proprioceptive sensations may make breathing or talking seem to require a great deal of effort. All this may produce a sense of loss of control over one's body or mind that can create great anxiety.

Smith and Mehl (1970) reported that "Recently fully half of the acute toxic reactions we have seen at the Haight Ashbury Clinic have been novice anxiety reactions, and a majority of them have involved 'straight' people over 25 years of age. We can expect such anxiety reactions whenever people with rigid personality structures committed to the current dominant value system experiment with illegal psychoactive drugs." They predicted, "As more young professionals, businessmen, and middle class parents (at the urging of their children) experiment with marijuana, we can expect an increase of these acute toxic reactions."

Fortunately, that prediction, though well founded, proved less than accurate. "The overall decline in clinical cases of acute toxicity . . . can probably be attributed to the general enculturation of marijuana use in the United States. This enculturation over the past decade seems to have crossed many barriers of age, occupation, and lifestyle, and combines social acceptance and a widespread understanding of marijuana's effects. Group reassurance as to the harmlessness of marijuana is undoubtedly therapeutic in preventing anxiety reactions as well" (Smith and Seymour 1980).

Several years ago, however, a new, negative psychological factor developed as a result of the conviction at Federal and international enforcement levels that extraordinary measures were needed to stem the rapid enculturation of marijuana use in the United States. These measures included sponsorship of the spraying of the herbicide paraquat on Mexican marijuana fields. On March 12, 1978, Joseph A. Califano, Jr., then Secretary of Health, Education, and Welfare, issued a warning that marijuana contaminated by the herbicide paraquat might be finding its way into the United States from Mexico. The Secretary warned that heavy use of contaminated marijuana could result in permanent lung damage. Secretary Califano based his statements on studies made by the National

Institute on Drug Abuse at the request of the White House Office on Drug Abuse Policy (National Institute on Drug Abuse 1978).

The authors had the privilege in the following months of working with the Center for Disease Control (CDC) in Atlanta on a clinical investigation of the effects of paraquat-sprayed marijuana (Smith and Seymour 1979; Smith et al. 1978a; Smith et al. 1978b). Shortly after Califano's statement, we began seeing patients at the Haight Ashbury Free Medical Clinic, and over a period of months 50 individuals appeared at the clinic presenting a variety of symptoms that could have indicated paraquat toxicity. Unfortunately, the most prevalent indicator was a positive analysis of paraquat in their marijuana samples by PharmChem Laboratories. When PharmChem's results were discredited by CDC as false positives, the clinic's paraquat-related patient load dropped dramatically toward zero. We may never know whether the paraquat scare was an experiment in terror propaganda or a genuine national health problem. We can only hope that it is never repeated.

Ironically, the paraquat scare was a major factor in the still-expanding market for domestic marijuana. "Home grown" was easy to recognize and was by definition most likely to be free of paraquat contamination.

Social factors. The effects one experiences with marijuana intoxication are greatly influenced by the setting--the immediate environment in which the drug is used. Young couples smoking grass together are likely to experience increased erotic feelings, while a student listening to classical music will probably describe the experience as aesthetic. In many circles, marijuana is used at parties as a social lubricant to relax inhibitions, reduce tension, and promote feelings of social warmth. Marijuana users are particularly susceptible to the influence of the people with them while they are intoxicated. If companions are seen as threatening or disliked, a toxic reaction may result (Smith and Mehl 1970). Conversely, loving and knowledgeable companions can usually help diffuse a potentially toxic situation.

Spontaneous recurrences. Usually referred to as "flashbacks," spontaneous recurrences occur in a drug-free state. As such, they are not really acute toxic reactions and should be considered as toxic reactions only if they produce anxiety or impair function. These recurrences are often reported as pleasurable (Brown and Stickgold 1976; Keeler et al. 1968).

The recurrences should not be confused with enhancement of perceptual awareness resulting from marijuana use or with a "contact high." The latter is the result of social suggestion and is related to the great susceptibility of the marijuana user to environmental influences (Jones and Stone 1969).

Chronic Marijuana Toxicity

Toxic reactions from the cumulative effects of chronic marijuana use are poorly defined. The brain damage resulting from chronic alcoholism, for example, is related to the associated malnutrition. Such effects do not result from chronic marijuana use in this country, since marijuana acts as an appetite stimulant and the chronic user continues to eat well. Chronic brain damage studies associated with marijuana use have not been convincing and clinical work has found no irreversible brain damage.

Reports from India (Chopra and Chopra 1957) indicate that chronic heavy use of charas (a potent cannabis preparation equivalent to hashish) may produce increased susceptibility to respiratory and digestive ailments and a kind of social indifference, but that regular use of bhang (a preparation comparable to most of the marijuana used in the United States) poses no significant social problem.

Much has been said recently about the high potency of new strains of marijuana by those who seem to have fallen victim to the overblown advertising claims of marijuana growers and salespersons. According to the clinic's most discerning street information sources, the marijuana from Hawaii and the California uplands is, indeed, "good weed," though not worth the highly inflated prices being paid for it. However, the high is reported to be of short duration when compared to that of more traditional strains of marijuana and, on the whole, is comparable to the "good weed" of 10 years ago. Further, marijuana intoxication is subject to a point of diminishing returns wherein there is little difference between the high produced by 1 joint or 10.

It is true that heavy daily use in certain young people seems linked to an "amotivational syndrome" characterized by a decreased desire to work, compete, or face the challenges usually associated with growth and maturation. This can also manifest itself in a learning disability. We view the compulsive and chronic use of marijuana, like chronic alcohol use, especially by the very young, to be counterproductive and unhealthy, both to the culture and to the individual (Smith and Seymour 1980). However, such impairment occurs only in a very small and susceptible segment of adolescent marijuana users. It should be noted, however, that such effects depend on the social environment and personality of the user and are not inevitable results of chronic marijuana use. The claim that amotivational syndrome is a sign of brain damage is not supported by large-scale clinical and epidemiological study. Most chronic users do not seem to develop impairment. Respondents in our paraquat study with heavy daily marijuana use were "by and large professional, white collar and skilled blue collar workers . . . productive and responsible citizens" (Smith and Seymour 1979).

Daily heavy inhalation of marijuana smoke, like inhalation of tobacco smoke, can produce bronchial irritation and may lead to long-term pulmonary damage. These chronic effects have not been verified, nor have exaggerated claims that small quantities of marijuana are

20 times more carcinogenic than tobacco cigarettes. Curiously, evidence of paraquat-induced lung damage has been serially rejected by the same regulatory and enforcement agencies that have been quick to embrace the theory that marijuana itself can cause permanent respiratory or cerebral damage, even though it may be based on ephemeral and self-contradictory data. It does appear, however, that when paraquat-contaminated marijuana is smoked, the burning destroys the paraquat and greatly reduces the pulmonary risk associated with this toxic herbicide.

CLINICAL AND RECREATIONAL USE OF MARIJUANA

The clinical uses of cannabis have begun to be recognized and applied. A succession of States is approving the use of marijuana's active principal, tetrahydrocannabinol, for several clinical indications, including the treatment of glaucoma and the control of nausea and vomiting in cancer chemotherapy. These therapeutic breakthroughs are establishing the role of cannabis as a valuable treatment agent with certain difficult medical problems.

As with any therapeutic agent, the side effects of marijuana as a medication need to be studied and reliable information transmitted to both client and physician. It is hoped that an objective and rational analysis with reliable consumer information will occur when marijuana is perceived as a medicinal agent rather than solely as a social-recreational drug of abuse.

On the clinical side of drug abuse, we are naturally focused upon abuse and find ourselves coming into contact only with drug abusers who are having clinical problems with their abuse. During the paraquat study (Smith and Seymour 1979), we had a rare opportunity to gather information from a population that had used marijuana for a variety of recreational and ideational purposes but had never faced a clinical crisis with it. Further, this population, which was neither the streetwise drug abuser nor the more recently identified middle class polydrug abuser, represented a cross section of basically normal, healthy people who had smoked a lot of marijuana.

The average age was 28.4. Many of the respondents were in their thirties. Ninety-five percent were white; 75 percent, male; 70 percent, living in San Francisco. Occupations cited included white collar worker, mechanic, marijuana sales, nurse, librarian, projectionist and stagehand, teacher, machinist, office worker, designer, editor, arts administrator, letter carrier. Obviously, these demographics do not fit any of the usual stereotypes of heavy marijuana smokers. Half of those who had ever smoked tobacco had stopped in the last 4 years. The majority almost never used such drugs as sleeping pills, tranquilizers, pain pills, cocaine, PCP, or psychedelics. All smoked marijuana, and 70 percent had been smoking it for more than 5 years. Thirty-five percent smoked one to six times per week, while 55 percent smoked one to three times a day. Most of the patients referred to San Francisco General Hospital for pulmonary workups were found to have no permanent lung damage, and the few that demonstrated respiratory abnormalities had other potentially causative factors, including heavy tobacco cigarette smoking (Smith and Seymour 1979).

A similar sample may have surfaced on April 26, 1981, when the National Organization for the Reform of Marijuana Laws (NORML) hosted a 10 kilometer run in San Francisco's Golden Gate Park. The 311 runners, who ranged in age from under 17 to over 50, completed the race in an average of 48 minutes. Winning times were 31:12.2 and 40:16.3 for males and females, respectively. We cannot state that all the participants were what would be considered chronic marijuana smokers, but the results of the race indicated that many marijuana users possess a high level of pulmonary function.

CONCLUSION

The overall issues surrounding marijuana toxicity are emotionally charged and fraught with contradictions. At the same time that enculturation of marijuana use is spreading across population barriers and becoming fashionable in a wide variety of circles, public officials and health professionals seem to be finding it politically expedient to take a hard line against its use. One unfortunate reaction to this surge toward abolition is an evident downgrading of the dangers our young face from alcohol and tobacco, two drugs whose physical dangers have been demonstrated beyond a doubt. What we are seeing is a condoned resurgence of these drugs of high abuse potential by the dominant culture, while the postulated dangers of marijuana are magnified in the public eye. For example, in recent national meetings on marijuana, one drug expert indicated that marijuana is the number one public health problem among youths, while another drug expert stated that he would rather see youths use short-acting drugs like alcohol and tobacco than marijuana. All scientific indicators demonstrate that alcohol produces far more damage and public health risk in adolescents than does marijuana, and the statements described above are based not on scientific evidence but rather appeal to public stereotype and current political ideology that overstates the dangers of marijuana and underreacts to the problem of alcohol. There are, as we have seen, clinically demonstrated instances of acute and chronic toxic dangers involving the use of marijuana. However, these dangers and other postulated effects must be viewed in perspective relative to other drug abuse problems in our society, including legally sanctioned drugs such as alcohol and tobacco.

REFERENCES

Brown, A., and Stickgold, A. Marijuana flashback phenomena. Journal of Psychedelic Drugs, 8(4):275-283, 1976.

Chopra, I.C., and Chopra, R.N. The use of cannabis drugs in India. *Bulletin on Narcotics*, 9(1):4-29, 1957.

Jones, K.[illegible], and Stone, C.G. "Psychological Studies of Marijuana and Alcohol in Man." Presented at the 125th Annual Meeting of the American Psychiatric Association, Washington, D.C., May 1969.

Keeler, M.D.; Reifler, C.B.; and Lipzin, M.D. Spontaneous recurrence of the marijuana effect. *American Journal of Psychiatry*, 125:384-386, 1968.

National Institute on Drug Abuse. *Contamination of Marijuana With Paraquat: Preliminary Report.* Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off., 1978.

Shick, J.E.; Smith, D.E.; and Meyers, F.H. Use of marijuana in the Haight Ashbury subculture. *Journal of Psychedelic Drugs*, 2(1):49-66, 1968.

Smith, D.E. The acute and chronic toxicity of marijuana. *Journal of Psychedelic Drugs*, 2(1):37-47, 1968.

Smith, D.E., and Luce, J. *Love Needs Care*. Boston: Little Brown, 1971.

Smith, D.E., and Mehl, C. An analysis of marijuana toxicity. *Clinical Toxicology*, 3(1):101-105, 1970.

Smith, D.E., and Seymour, R.B. The enigma of paraquat contaminated marijuana. *The Street Pharmacologist*, 2(1):8-10, 1979.

Smith, D.E., and Seymour, R.B. Perspectives on marijuana and health 1970-1980. In: *NORML 10th Anniversary*. Washington, D.C.: NORML, 1980.

Smith, D.E.; Seymour, R.B.; and Bordas, H.K. *Paraquat on Marijuana in the San Francisco Area*. San Francisco: Haight Ashbury Free Medical Clinic, 1978a.

Smith, D.E.; Seymour, R.B.; and Walsh, J. *HAFMC: Medical Clinic Guidelines for Paraquat Acute Toxicity Screening*. San Francisco: Haight Ashbury Free Medical Clinic, 1978b.

A Family Approach to Marijuana Use

H. Charles Fishman, M.D.

We have been asked to address whether there is clinical evidence that marijuana compounds a problem of maladjustment by reinforcing rebellious, negativistic, and poorly motivated social adaptation, and furthermore, whether marijuana use leads to developmental changes or psychological aberrations, including behavioral problems.

Underlying these questions is, to my thinking, an unfounded optimism that we as clinicians can discriminate between factors. Instead, in attempting to address these issues, I found myself repeatedly pondering the chicken and the egg. Do the psychological problems that lead to marijuana use tend to exacerbate as part of their own natural history and hence lead to increased use? Or does the marijuana compound the social and psychological problems, thereby leading to more marijuana use? The answers to these questions are best left to the researcher. We clinicians must deal with the problem as it presents in context--as an often escalating confluence of factors.

But there is another aspect of the optimism underlying these questions that I find unrealistic and impractical. Not only is it impossible to factor out marijuana as a variable in a clinical presentation, it is not practical to imply that even if marijuana could be isolated as a noxious element, it could be controlled or eliminated in our communities.

Efforts at control ranging from the halfhearted to the quite systematic and vigorous for almost a generation have failed to stem the increasingly popular acceptance of the substance. It is impractical at this point to hope that there can be any effective control of marijuana given current beliefs and mores.

Instead, we might look at marijuana as a pervasive noxious agent in our communities to which teens and young adults are particularly vulnerable as hosts. We then need to ask a different question--What is the best way to strengthen the host so that the harmful effects of the noxious agent will be minimized?

We are then faced with a therapeutic issue--determining an effective way to intervene to strengthen the host and thereby ameliorate the substance abuse. It is my experience, based on a research project conducted over a 3-year period from 1977 to 1980,[1] that one effective way to conceptualize the issue and treat teens who use marijuana is via a family approach. I shall report briefly on this approach as it evolved during this project.

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[1] This project, titled "Adolescent Substance Use in Three Family Contexts," by Bernice Rosman and H. Charles Fishman, was funded by the National Institute on Drug Abuse (Grant No. 5R01DA01629).

Since marijuana use is such a diverse phenomenon, before proceeding further, I shall define the pattern of use I am addressing here. Kandel, in a series of studies, found that adolescent drug abuse follows three specific configurations (Kandel et al. 1976). The first is the use of legal drugs and is primarily a social phenomenon. The second is tied to the normal, albeit often wrenching, process of growing up, which frequently involves experimenting with new behaviors. In this case, the use is part of the process of development of autonomy and differentiation from the adolescent's parents and involves strengthened extrafamilial ties, rebellion, and increased self-assertion. Taken in context, marijuana use represents part of the configuration of separation and differentiation from one's parents both in terms of mores as well as the physical act of leaving home. There is considerable controversy about how serious a problem this type of use represents. Stanton (1979) states that "with this constellation the problem may be more one of parental fear than actual danger. This is not to deny the harmful effects so much as to question how effectively we could prevent young people from doing a few 'stupid things' whether they are drug related or not. Drugs are presently more a part of the process now than they have been in the past, but, if there were no drugs, other things would probably take their place."

The third pattern of drug use revolves around the process of using drugs regularly and compulsively. I deal here with youngsters who fit into this third pattern of abuse. There are youngsters who have high levels of personal dissatisfaction and depression as well as strong feelings of alienation from parents. The users who go on to other drugs come from this group. Kandel et al. (1976, p. 455) state that "While drug use by peers is the most important factor for initiation into marijuana use, progression to other, more serious drugs depends increasingly on intrapersonal factors and not as strongly on values and activities characterizing the peer group."

There is no doubt much agreement that teenagers who fall into this third group have numerous difficulties. From my point of view, these difficulties are not distinct from, but instead are continuous with, problems in the youngster's family. There is considerable literature that supports this premise.

In a review of the literature, McGlothlin (1975) concluded that users are more likely to come from broken homes of above-average social economic status, and to describe their parental relationships as poor. They are more likely to have fathers who use alcohol and tobacco and mothers who use tranquilizers. Prendergast (1974), using data from 54 high school students, found marijuana use occurring more frequently in families in which the father was well educated and used prescription drugs. In these families, there was mild disapproval of the use of marijuana, and the child tended to perceive the mother as exerting relatively lax control. Hunt (1974) described a correlation between the extent of drug use and the amount of parental control. He found an inverse relationship between restrictive parent-child relationships and the amount of marijuana use. Steit et al. (1974) confirmed this with the finding that marijuana users described their parents as granting more autonomy than did nonusers.

Marijuana use is a problem that frequently follows a habitual pattern within the family. Smart and Fejer (1972) reported that there tended to be a correlation between the amount of marijuana used by high schoolers and the rate of tranquilizer, stimulant, and barbiturate use by the parents, although there did not appear to be a pattern of parental use distinctly applicable to marijuana users. Similarly, Kandel (1973, 1974, 1975) has found that marijuana use by peers is a better predictor than drug use by parents. There appears to be an additive factor since all of those with the highest use were reported by subjects whose best friends and parents were drug users.

Similarly, Baumrind, Blum, and the Jessors (quoted in Brook et al. 1978) have found that a common thread in resisting drug abuse is the traditional family structure, which serves to insulate the adolescent from drug use. They found that the greater the degree of maternal and familial control, the less likely it is that the adolescent will use drugs. According to Blum, drug-free families place a high premium on achieving and have high expectations for their children. The parents in drug-free families engage in a number of shared activities with their offspring. In short, these authors have described well-functioning families, in the sense that there is a great deal of focus on the children as well as a tendency to maintain a close family unit. The more active, demanding, and involved parent who presents a model of strength and who monitors a child's interactions and familial and peer activities tends to have a child who is less involved with drugs, especially marijuana. Brook et al. (1978) reported that more assertive mothers have a lesser number of drug-using children. A corollary study by Brook et al. (1981) shows the importance of the father-and-son relationship in relation to decreased marijuana use. In general, the findings demonstrate the importance of an affectionate father/son relationship, with closeness being negatively associated with marijuana use.

Functional family structure appears to strengthen the resistance of the teenager to marijuana use. There are certain principles we utilize to enhance family functioning. These tenets, which represent clinical observations and theoretical assumptions, proved valid in a sample of chronic marijuana users, ages 11 to 17, and their families, who were treated as part of the research project noted above.

A major theoretical assumption derived from systems theory is the concept of circular causation. Rather than viewing marijuana as the cause of a certain behavior, or the family or the youngster as the primary cause, all these factors are seen as mutually reinforcing.

A does not cause B; instead, A and B form a self-recursive system--each one complementary to the other. The chicken and the egg become two parts of the same thing, each an essential precursor of the other. This conceptualization is based on the notion that clinicians must be concerned about factors that maintain problems.

From this vantage point, the question of etiology is eschewed. Instead, one is interested in the complementary patterns of interaction between the youngster and the context that maintain the problem of marijuana use. Our clinical interest is in not what caused the problem but, instead, what maintains the problem.

In our sample, marijuana use reached moderate to severe levels and hence became a symptom at a point of developmental crisis for the family. Often the "passage" was the youngster entering adolescence, but not always. At other times, it was a father entering into a midlife crisis, the youngest child entering school, or the death of a parent. Frequently, the family was facing a number of such passages simultaneously.

With a model of circular causation, even the developmental event does not occur in a vacuum but is influenced by numerous complementary changes. The child enters adolescence, wants to be more autonomous and peer related, and spends more time away from home. Mother, with whom the child was very close, becomes despondent and withdrawn. Father, noting a change in his wife's availability, begins to fear that he is losing his virility since his 40th birthday is coming up. All of these interconnected events lead to a disruption of the family homeostasis. Patterns that had worked satisfactorily in the past are no longer adequate. The family is in crisis--rules that had previously functioned adequately no longer hold.

At this point, the youngster develops a symptom--heavy marijuana use. The parents, who are very concerned, focus their attention on the teenager and the pot smoking. The previous structure, in which the child needed a lot of attention from the parents, is reestablished. The parents then, instead of evolving new patterns appropriate to the family's new stage, focus on the child--much as they did when he or she was younger. In this way, the youngster's problem maintains the family homeostasis while impeding the evolution of family structures.

The teenager's use provides a paradoxical resolution of developmental needs. He or she can have the autonomy, albeit pseudo, provided by the drug abuse and at the same time, can stay very much involved with the parents. In this sense, it is a pseudoresolution since the youngster is neither successfully separating from the family nor differentiating in a way that will allow for competent autonomy.

The drug abuse and the family dysfunction are mutually reinforcing. That is, there is a circular pattern--the youngster abuses drugs and stabilizes the family homeostasis. At the same time, the need of the family for the stabilizing effect of the symptom continues to maintain the youngster's abuse of drugs.

If one looks closely at family interactional patterns, such as via videotapes, one sees the subtle ways in which the family supports the youngster in the abuse. One parent may well side with the youngster against the other. Or parents may have shifting coalitions in which one, and then the other, supports the child. In this way, the problem is maintained. At the same time, the problem tends to maintain the dysfunctional family structure, as for example when one parent is allied with the child against the other parent.

Given this model of marijuana usage, we need to look at a larger unit--the teen plus the significant social context, especially the family--in order to address the question of how to strengthen the host. With a model of circular causation, the youngster is vulnerable to marijuana when he or she and the family system are having trouble traversing their current developmental stages.

The symptom of marijuana use cannot be seen in isolation. Instead, we as clinicians would do well to view the abuse in the context in which it occurs--the family--and intervene to ameliorate the difficulties of a system in trouble. We need to broaden our therapeutic lens to see the child and the family as the patient. Then the marijuana, ever available in our culture as a potential noxious agent, will be rendered innocuous.

It is my premise that if we, as professionals, focus on the marijuana and not the interpersonal difficulties that maintain it as a serious problem, then we are falling into the trap of seeing the symptom and ignoring the family dysfunction that accompanies it. If we emphasize marijuana, a presence in our society that we cannot realistically hope to control, then we are ignoring and thereby perpetuating family problems, which we could hope to do something about.

Let us not squander our precious resources fighting an already lost battle. Instead, we need to pragmatically direct our energies to providing therapeutic input and support to the young person and his or her family, thereby increasing the resistance of vulnerable young people to the noxious influence of marijuana.

REFERENCES

Brook, J.S.; Lukoff, I.F.; and Whiteman, M. Family socialization and adolescent personality and their association with adolescent use of marijuana. Journal of Genetic Psychology, 133(2): 261-272, 1978.

Brook, J.S.; Whiteman, M.; and Gordon, A.S. The role of the father in the son's marijuana use. Journal of Genetic Psychology, 138:81-86, 1981.

Hunt, D.G. Parental permissiveness as perceived by the offspring and the degree of marijuana usage among offspring. Human Relations, 27:267-285, 1974.

Kandel, D.B. Adolescent marijuana use: Role of parents and peers. Science, 181:1067-1070, 1973.

Kandel, D.B. Inter- and intragenerational influences on adolescent marijuana use. Journal of Social Issues, 30:107-135, 1974.

Kandel, D.B. Some comments on the relationship of selected criteria variables to adolescent illicit drug use. In: National Institute on Drug Abuse. Predicting Adolescent Drug Abuse: A Review of Issues, Methods and Correlates, D.J. Lettieri, ed. DHEW Pub. No. (ADM)76-299. Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off., 1975.

Kandel, D.B.; Treiman, D.; Faust, R.; and Single, E. Adolescent involvement in legal and illegal drug use: A multiple classification analysis. Social Forces, 55(2):438-458, 1976.

McGlothlin, W.H. Drug use and abuse. Annual Review of Psychology, 26:45-64, 1975.

Prendergast, T.J., Jr. Family characteristics associated with marijuana use among adolescents. The International Journal of the Addictions, 9:827-839, 1974.

Smart, R.G., and Fejer, D. Drug use among adolescents and their parents: Closing the generation gap in mood modification. Journal of Abnormal Psychology, 79(2):153-160, 1972.

Stanton, M.D. Drugs and the family. Marriage & Family Review, 2(1):1-5, 1979.

Streit, F.; Halsted, D.L.; and Pascale, P.J. Differences among youthful users and nonusers of drugs based on their perceptions of parental behavior. The International Journal of the Addictions, 9:749-755, 1974.

Discussion Highlights: Smith and Seymour/Fishman

Macdonald: I agree with all of the things that Dr. Fishman suggested, but to think that we should not attack the supply problem is a mistake.

Fishman: I don't think it is practical to use our limited resources to fight a battle that is already lost. Youngsters can grow marijuana on their window sills. I don't think, practically speaking, that we can make a dent in the supply cycle.

Voth: I am troubled by Dr. Smith's statement that acute toxic reaction, disorientation, confused states, short-term memory loss, and a variety of perceptual moods and conceptual alterations cannot be considered toxic reactions if these effects are desired by the user of marijuana.

Smith: Individuals use marijuana at rock concerts and find the alteration pleasant. Another user in another psychosocial setting may find the same pharmacological effects unpleasant. I think that what one individual finds unpleasant and therefore toxic another may self-define as pleasant. The self-definition of unpleasant experiences brings individuals into treatment settings. For example, the use of marijuana elevates pulse rate. Some individuals who have this physiological effect have come to accept it. However, others experience cardiac anxiety and come in with the self-perception that they are having a heart attack. The physiological response of the elevation of pulse rate is the same; the user's perception of it is quite different. The drug elevates pulse rate in all the individuals who are taking it. It may even elevate it to precisely the same level. One group just accepts the fact that marijuana elevates pulse rate. Another group of users become very anxious and think they are having heart attacks, and come into the treatment program. The physiological response is the same--it is the psychological set and social setting that vary.

Halikas: I would like to address both Dr. Smith's and Dr. Fishman's papers. They give us the notion that not all marijuana users have problems. There are grades of problems and different types of problems. An approach to the marijuana user should be based on the alcohol model approach of abstinence information and clarification about what the user is doing. Families perpetuate drinking problems. Families also perpetuate ill members of the family, in this case the adolescent. Dr. Fishman has given clinicians some clues as to how to look at each family in motion.

Milman: I would like to return to Dr. Durell's point about developing a consensus, if possible. I wonder if each of us could comment on prevention. You are dealing with treatment, Dr. Fishman, and I certainly agree with the concept of a disturbed family system, a concept that offers an approach to treatment that may be more useful than individual therapy in certain instances. I agree with Dr. Smith that we want to inform and educate. But don't we need also to become concerned with prevention? And if so, when and how?

Smith: I would like to react based on Dr. Fishman's presentation because I hope that's what our bottom line is: the health of young people and providing objective criteria to those working with the problem. I felt Dr. Fishman's paper was excellent. I have seen a family situation in which a single episode of marijuana use with no physical or psychological toxicity associated with it has produced a major destructive interaction within the family. But that family's overreaction, in part based on inaccurate information, has produced destructive interaction between child and parents that is far more damaging than the use of the drug. No communication could occur in that setting. I have seen other family situations in which a single episode has occurred and the family has been open to communication and family therapy. The difference in family response to the single episode was the difference in whether they entered into an effective prevention technique; the first family's inappropriate reaction to a single episode was severely disruptive to parent-child communication and totally eliminated any possibility, in my opinion, of effective prevention. Their reaction was based in part on inaccurate information about the significance of a single episode of marijuana use.

Fishman: To reiterate, the position I am advocating is that both the treatment and the prevention of marijuana use should be based on the concept that the patient is not only the child, but the family, and that there are certain facets of a youngster's personality that make him or her more or less vulnerable to use of marijuana. Those facets are called forth or recede depending on the dynamics of the family.

Durell: I think Dr. Fishman's paper presents a concept of causality exceedingly useful for planning interventions with such families. I was troubled, however, by what seemed to be an unnecessary reduction of certain issues to the category of "either A or B." For example, I see no need to reduce the emphasis on supply-side issues. Similarly, I see no need to minimize focus on the effects of the drug itself. We can emphasize the importance of those issues, as well as the importance of the family system's maintenance of drug use, when that appears appropriate. In treating alcoholics, for example, it is very important to focus on the substance use itself. The clinician certainly recognizes and deals with the fact that there are family initiating and sustaining issues. But, as

Dr. Smith said, many families may simply be handled with an educational approach that focuses primarily on the drug and the importance of achieving abstinence. When the effects of the drug are no longer distorting the psyche of the patient, the family is able to alter its interaction patterns without any sophisticated family therapeutic interventions.

Fishman: I would agree completely, and as a family therapist I would see the family intervention that you have just described as being important. Frequently it's sufficient.

The family can more realistically control supply than can the government. The welfare of their child is, after all, the family's responsibility.

Durell: I wanted to ask Dr. Smith what he thought of my earlier statement that 3 percent is probably an underestimate of the percentage of adolescent users who get into marijuana dependence.

Smith: I can live with the way you formulated that statement. I believe that the susceptible population of heavy marijuana users probably runs parallel with the susceptible population of alcohol abusers. As long as you say "probably" in formulating your statements.

My concern is the absolute statements being made outside this room. There are no data to support them, but they sound very authoritative.

Durell: I share that belief. I think the questions about information that you raised are exceedingly important. Speaking as a clinician dealing with patients in your office, you might wish that the information to which people are exposed were more extensive and more qualified.

Indeed, from the point of view of a clinician, you are probably correct in believing that you could work more effectively with your patients if the information to which they are exposed were more precise. But the fact of the matter is that the vast majority of people ~~who~~ consider using marijuana will not have the opportunity to discuss it with a clinician. We, therefore, must consider how informational materials are understood by that portion of the population that doesn't have the advantage of being able to discuss the information with an informed clinician. When informational materials are prepared, one has to be concerned with the question of the context in which the materials are to be used. I don't disagree with what you have said, Dr. Smith, from a clinician's perspective. I do think we must be careful in generalizing from that viewpoint to what kinds of informational materials would best serve the majority.

Macdonald: There are a lot of gray areas involved in this issue. Take the example Dr. Smith gave of the child whose parents resorted to radical treatment on the basis of one joint. One thing that needs to be answered is that if you come down on the young person too strongly, will that youngster rebel and smoke marijuana for that reason? I guess that happens to some youngsters. But take the child who gets an order from a parent not to smoke joints in the house, smokes anyway, and is then put into treatment. That tells you a lot about that family. In that instance, the family had a lot of troubles that predisposed the one-joint episode. That child and that family are already in trouble anyway. I don't see that as a reason for us as physicians, clinicians, and parents to say that marijuana is a bad drug and youngsters should not use it.

Niven: I don't agree with Dr. Macdonald that the family Dr. Smith talked about is "already in trouble anyway." In my experience, many sensitive and concerned parents get very alarmed about their children's drug use, in large part because the information that they are reading in the press is alarmist. For example, clinically I deal more with the unwarranted anxiety of parents about PCP use than I do with youngsters who are having problems as the result of their PCP use.

I also feel that the distortion of information that is taking place cannot be readily dismissed, either by saying we just can't worry about it, or by stating that we have to focus on supply issues. Over the years, people have killed to stop the supply of drugs (with little if any success), and in my view, accurate information about drug issues is much more likely to be beneficial to our society than efforts at interrupting supply.

Smith: The family can be misinformed. For example, we have a history of beliefs that masturbation leads to insanity. A well-intentioned family will think all kinds of horrible things about their children when observing a single episode of masturbation. To say that this is not a valid concern, I think, understates it in the opposite direction. In 1969, I heard a psychiatrist give a passionate plea for the use of electroshock therapy in eliminating episodic use of marijuana. Many families believed that the episodic use of marijuana was so horrible that it justified the use of electroshock therapy. I would hate to see overstatements and inaccurate statements recycle such extreme approaches. If, in fact, using objective criteria, we do determine that abuse exists, there are reasonable treatment programs that can be used. Families that receive misinformation have been panicked throughout the history of psychiatry into having horrible things aimed at their youngsters.

Chapter 5

Marijuana Abuse by Children and Teenagers: A Pediatrician's View

Ingrid L. Lantner, M.D.

I have practiced pediatrics in a middle and upper income area near Cleveland, Ohio, since the late 1950s. During the last few years I have noticed gradual changes in the attitudes of a significant number of my teenage patients. They no longer seem the ambitious, witty, communicative, goal-oriented people they once were. I also began to receive more referrals from school nurses for physical examinations because of frequent visits to the clinic, persistent fatigue, inertia, and occasional sleeping during class. An increasing number of my patients were school referrals with problems of social adjustment and immaturity.

Although I was puzzled by this trend, I did not suspect the use of marijuana as one of the possible causes until about 3 years ago. Before that time I had little interest in drug abuse, having considered this problem of no significance in my practice.

Because of an unusual incident, I became aware of the widespread use of this drug among our youth. One of my patients told me about the symptoms he had developed from chronic and heavy use of marijuana, as well as changes he had observed in his cannabis-using friends. I started interviewing my patients, asking them specific questions about their school activities and drug habits. Most of them were very frank and also quite keen in their observations. It took me a while to accept the fact that a majority of the teenagers in my area use marijuana and that more than 10 percent use it daily.

I began to report my observations to our local press and was asked to participate in several radio and TV programs. Several schools invited me to discuss the problem of marijuana use with their students; this has given me the opportunity to interview many more cannabis users than I would have been able to reach in my own practice. Because of my interest and the media exposure I have received, it is possible that I may have singled out a special group of marijuana users, namely, those who are interested in being helped, or whose families noticed the marked impairment and felt that intervention was needed. I receive many calls from chronic marijuana users, their friends, and families.

My work in this area has improved my skills in interviewing; I have learned to ask the necessary questions without offending and alienating the youngsters. In the process I have also developed a keener ability to diagnose the more subtle signs and symptoms of marijuana use.

Any medical condition has different degrees of severity, and this is the case with chronic marijuana intoxication. I don't believe that anyone can diagnose an occasional experimenter or a very light user. Because symptoms are dose and time related, it may take almost a year to notice the gradual changes in a regular weekend smoker. The frequency of use and the potency of the marijuana are significant. Although not everyone develops all of the symptoms, I have observed a typical syndrome that slowly develops in all regular users.

I will discuss my clinical observations by sharing short histories of several heavy (daily) marijuana users. Although I have noticed similar changes in moderate users, who smoke two to five joints per week, their deterioration was much more gradual and their symptoms were less striking to the untrained eye. I have been careful to include only those patients with no prior history of maladjustment whose symptoms either disappeared or were alleviated, without medication or change of environment, after their marijuana habit was discontinued. In all, I have followed about 50 patients.

R.S., age 18: This young man comes from a happy, close-knit family. His mother, who never worked outside the home, spent most of her time interacting with the children. His older sister is not on drugs. They are all nonsmokers and use alcohol only occasionally. According to the parents, their son was popular, active in sports, outgoing, and respected by everyone. He often planned and organized activities for friends and was quick to accept new challenges. With an IQ of 139, he had a 3.8 average in eighth and ninth grades. Later, he was inducted into the honor society and was on the dean's list. He was planning to study architecture and landscape design and eventually hoped to have a company of his own.

R.S. and his parents had an excellent rapport; he and his father often took long bicycle trips together. His father noticed that his son was becoming isolated, alienated, and irritable, and that at times he acted very peculiarly. The father never suspected marijuana use, thinking merely that R.S. was going through a phase. His mother noticed the changes in his behavior and was shocked by the four-letter words he often used. Although she was aware of marijuana in the area and followed my articles, she thought he was "too sound and bright to get into pot."

R.S. had started using marijuana only 2 years ago, with daily use for the last 8 months. "I can say that I would spend more of my waking hours high than not high, and that's lots of pot. I would start doing irrational things like going down the road at 60 miles an hour and would say, 'Hey, this is not going to do any good,' but I would not care. It was like something was controlling me." He started experiencing depression and even contemplated suicide. "I noticed sometimes everything had just crumbled around me, and I would come up with these elaborate ways to kill myself, to hurt these people that I thought were hurting me." Paranoia bothered him. "I would come up with these things in my head, that all of my friends and my girlfriend, and all these little moves that just happened to be coincidental, were planned to set a certain scheme to get at me." His moods changed suddenly, and he could not control his temper. "I could feel all of the different moods like depression, anger, and paranoia at the same time, and it made me feel flaky. I could be happy and having a great time, and then something just would click, like somebody turned a switch inside of me, and I would be this totally different person."

The feeling between him and his girlfriend changed. "We became more irritable. We would start clawing at each other. We would never be sure anymore if the other person was just kidding. My girlfriend once said, and I will never forget the pain on her face, 'You never smile any more. Before you were happy and smiling and changing. Now when I try to be nice and cuddle up to you, you just stare blankly at me, like, what are you doing?' At first, when we started using pot, we would feel that way, like making love, but later you just start losing interest. You think, 'Who cares? We will just sit here.' Before, I guess you could say I was interesting. I would say I got kind of boring."

His grades went down, and he no longer cared about his work. "We would come back to the room after class, turn on 'General Hospital,' turn off the sound, turn the hi-fi on, and get high. That's what we did in our free time, afternoon, evening, just right along. That was our entertainment. I dropped out of all sports. I would get high and think, 'I will study in an hour or two.' The hour would come; I would be so high that I would not care, I would think, I am not going to do it, let's just keep getting high." Many times he contemplated quitting college, getting just any job and working.

He noticed forgetfulness and memory loss. "I often could not remember what day it was, and what I was doing the day before, or if anything at all. Lots of times I would be talking along, and if someone would interrupt, I would totally lose it. It would be as if I would be on tape, and someone would take a pair of scissors, and just cut the tape, and throw the rest away, and it was not there anymore, and I could not get it back. And I would forget the names of people I was introduced to just 5 minutes later. And it was not that I did not pay attention. I would pay attention, but it had slipped away. Someone would say, 'Gee, what a burnout you are,' but you would laugh it off. So I forgot--it must not have been important. One started not caring about anything!"

For the first time in his life he started deceiving his parents, hurting them on purpose. "I love my parents a lot, and when I look back at the time when I was on pot, I did not care that I hurt them; they were like my enemies. Lots of times I felt, well, this will burn them good!" He started not to care about his clothes, hair, or general appearance.

He began to fail, but not completely, and as he slid lower and lower, his self-esteem decreased. "I was getting depressed because everything just seemed to be collapsing. I did not know where to turn to. That's when my mom asked if I am on pot. It was almost like a relief. I had to turn to them. I had tried on my own, and I knew that I could not help myself. I am off pot now, and I'm determined to stay off. I am quitting for my own survival, because if I kept going that course, I would have ended up probably flunking out of school, probably would have ended up getting into trouble with the law. I want to become the person I used to be, and to be a happy person again. The word that I would like to use for the way I felt when on pot is it 'strained' me to do anything; it was a real 'strain.' Physically I felt like dying. The chest pains, they were like somebody would tie a rag around me and keep pulling it tighter and tighter, and when it was like in a knot, someone would stand on my chest, and it would hurt a lot. Not only mentally--I had no motivation, I did not have any energy. It strained me to do anything. I have not used pot for some weeks, and I feel better already. My head is clear for the first time in months. I can think, and my head does not feel like filled with air. It's like a lid has been lifted. I still get depressed, but it's getting less."

S.L., age 14: This boy's family is intact. Both parents are professionals; his mother works part time while the children are in school. He is the youngest of three; the other siblings are not drug users. He was always an A student, one of the best in his class. An eager tennis player, S.L. took lessons and practiced daily, hoping to make the school team. He also played basketball and baseball; he used to ice skate during winter months and swim daily during the summer. He often made models in his free time. His relationship with his parents and siblings had been warm and caring. His parents noticed changes during the course of a year--sudden changes of mood, irritability, use of foul language, sleeping afternoons, staying alone, and gradually dropping out of sports. He complained that tennis was "too much hassle"; he would interrupt his lesson halfway through and just leave. He felt tired and coughed a lot. His grades dropped, and his teachers began to complain about his inertia. He was changed from honors math to a regular class. He no longer enjoyed debates and challenges. He stopped taking piano lessions, hardly practiced his guitar, and often stayed by himself listening to rock music.

S.L. started using marijuana at a tennis camp, and for 7 months was smoking one to three times daily. He used incense and a fan to hide the smell from his parents, who did not suspect this habit until they found a pipe and marijuana in their son's room. "It was almost as if he wanted me to find it," his mother said. They consulted a pediatric psychiatrist because they did not know what to do and because of S.L.'s depression and talk of suicide. The psychiatrist advised them not to interfere with his habit if it was kept in moderation, because otherwise it would alienate him even more; besides, according to the psychiatrist, the drug would ease his depression and help him to develop a better rapport with his father. Because his grades continued to drop and because he complained about forgetfulness, his parents decided not to follow the doctor's advice.

After 2 years, S.L. is totally drug free. He is again active in sports, and his grades are back to As and Bs. He has regained his previous cheerful, caring personality and is planning for college. Again taking piano lessions, he has signed up for music theory and composition.

J.R., age 20: J.R.'s father is president of a large company; his mother never worked outside the home. There are no marital problems. His one sister does not use drugs. With an IQ of 145, he was an A student throughout elementary and junior high school. He was popular with girls and had lots of friends. He had leadership qualities, loved to plan ahead, and was good in all sports. He started marijuana at 14 because "everybody did, and I was curious." He used drugs daily from the age of 16 and during the last year of use, from 8 to 10 times per day.

He just barely graduated from high school and enrolled in college. Having dropped out of sports during high school, he spent most of his time "thinking, doing, and sometimes dealing pot." J.R. made failing grades in college. He was plagued by depression, feelings of isolation, an inability to develop lasting relationships, paranoia, panic, despair, and he often thought of dying. He remembers many times driving his car without any feeling of speed, time, or direction. "It was almost as if I wanted to crash." He had no ambition or motivation left. "My memory was completely gone; I think I was able to keep up with school so long because I started out pretty smart." He no longer had any girlfriends. Because he had often been impotent and finally lost interest in sex altogether, he learned to avoid embarrassing situations. He no longer cared about his appearance.

While at college, he read one of my articles and decided to come home to get some help. "I did not look like this last week. I cut my hair before the appointment," he told me at our first meeting. "I was just marking time. I was voted by my friends to be the first one to die within the next year. I was desperate. I just hope that one day I will be able to function properly again. I don't think I will ever make college, though."

One year later, he has been off all drugs. He is working on construction, plans to get married in a year, saves his earnings, and seems to be cheerful and happy, but does not talk about returning to school. "My memory is not as it used to be, and I get panicky when I have to meet any new challenges."

L.T., age 13: L.T. comes from an intact family. His father is a district sales manager; his mother, a part-time secretary. His brother is not on drugs. L.T. started using marijuana at age

11, but never at home and mostly after school in friends' homes or vacant lots. Before he started taking drugs, L.T. was friendly, always on the go, good in school, and good in sports. His parents noticed that his grades dropped from As and Bs to Cs and Fs. He became moody, irritable, and suspicious toward his teachers and even his friends. He had a frequent cold and a constant cough. Always tired, he often slept in the afternoons. After his father was diagnosed as having acute leukemia, most of the boy's changes were felt to be emotional. Nobody suspected marijuana use, as he attended a Catholic school. After he dropped out of all sports, he became depressed most of the time. He describes an unpleasant experience while coming home from a pot party: "I suddenly realized that all of the cars in the street were out to kill me." He sometimes saw floating blotches of color and "sometimes small animals on the walls, and that scared me."

After 2½ years, he stopped his marijuana use completely, became active in a peer support group, which he helped to organize, was back in his sports, and regained his good grades. According to his mother, he is again his cheerful, pleasant, argumentative self.

K.C., age 17: This girl is from a caring, interacting family without any marital problems. Her younger sister, age 14, is not on drugs. K.C. used to be an excellent student, always doing special projects, always active in sports. She started smoking marijuana at 15, and for the last 2 years has smoked daily. Her parents noticed increasing depression, with almost daily talk about suicide. She complained about poor concentration and loss of interest in her school activities because of constant fatigue. Mathematics and abstract thinking started to give her special problems. She gradually gave up all of her hobbies and sports. She started sleeping in, missing school, and taking naps in the afternoon. The family noticed that her physical appearance no longer mattered to her. She was irritable, moody, and difficult to get along with, becoming more and more withdrawn. She talked about dropping out of school and taking a job; her ideas for the future became totally unrealistic and impossible. She left home 3 weeks prior to her 18th birthday and dropped out of high school 2 months before graduation. She could not give any special reasons for her actions.

K.C. had had several counseling sessions with different people before I saw her. In these she was advised of the need to improve her self-image, but marijuana was not considered a problem. Because her parents felt marijuana smoking was merely a fad of today's youth, no attempts had been made to make her stop using it. After I saw her, she was able to discontinue her habit, and 2 years later she is completely off marijuana. She received her high school diploma and is in college, where she is working hard. She seems happy and gets along beautifully with her parents. She has resumed her previous hobbies and sports. At times she feels tempted to try marijuana again since most of her friends at college use it, but she has decided against it, remembering her previous depressions and inability to cope with her life.

M.P., age 15: M.P. started her marijuana use 1 year before coming to see me, and for the previous 6 months had been using it daily, at an average level of three joints a days, but much more on weekends. Her mother had noticed sudden changes in attitude, which she described as "Jekyll and Hyde," and was upset about her daughter's abusive and offensive language. "She is not my sweet, loving child anymore. She acts at times like a hostile, angry animal." M.P. had been happy and active in organizing programs for her youth group. She had had an especially good rapport with her mother. Her grades dropped from As and Bs to Cs and Ds. She kept forgetting her books at school, not caring about her homework. She complained about tiredness, coughed, had difficulty falling asleep, and started missing school.

Two years later, she was able to discontinue her marijuana habit and was free of drugs for more than a year and a half. She helped me organize a peer support group for ex-marijuana users and was delighted to interact with some of my patients who needed more help. Her school grades returned to As and Bs. According to her mother her happy, outgoing personality returned. "It's great to have my own child back again."

Then 6 months ago she fell in love with a drug dealer, started using marijuana again, and became rebellious, agitated, hostile, and verbally and physically abusive; her personality switched, according to her mother, "to the pot personality I had observed with her before." She left home, hitchhiked with her boyfriend to California and was picked up by the police because the FBI was looking for him. She refused to see her parents despite their several attempts at seeing her, stating that she wanted to stay on drugs forever.

After being admitted to a drug treatment center in Minnesota for 6 weeks, M.P. returned home a few months ago. According to her mother, she is again her "good, sweet self, but I am constantly afraid about her motivation to stay off drugs."

T.K., age 16: T.K., the older of two children, began to use marijuana at age 14. His mother noticed some personality changes. "I had a gut feeling that something was very much wrong," she said, but she did not suspect drug use until she found his pot pipe. She felt that he was just trying the drug and forgot the incident. When his teachers overheard him discussing marijuana dealings, his parents were prompted to seek counseling with their family doctor and a drug counselor. The mother felt almost embarrassed that they were overreacting. T.K.'s personality continued to change. He used to be helpful, enjoyed talking about his friends, and loved to visit his grandmother--all that stopped. His grades dropped from A to almost failing and he dropped off the basketball team. He did not seem to care about anything and had no energy or motivation. He became abusive and aggressive, using four-letter words, which was unusual for him. The result was total alienation from the immediate family and from his grandmother.

After the first visit with me, T.K. discontinued marijuana use for 3 weeks. He bounced back to his pleasant, cheerful personality, improved his work habits, and started again playing basketball and practicing his guitar. Then he suddenly changed again. After visiting a friend who used marijuana, he did not come home and refused to return for counseling. He became aggressive and disrespectful in school, irritable and impossible to handle at home. Because he resisted arrest when stopped for drunken driving, he was sentenced to a detention home; from there he was put on parole and ordered to attend a peer support group. He ran away and stole a car, which he drove to Florida. He was admitted to a drug treatment center but was discharged before the course was over because he failed to cooperate.

T.K. promised to stay off drugs and was drug free for several weeks. His attitude changed. People who had not seen him under the influence of marijuana would not believe that this pleasant, warm, intelligent youngster could have acted as was reported. Back in school, he worked hard, intending to catch up with his grades and to start playing basketball again. While on parole, he refused to attend any counseling because he was sure he could make it on his own.

Although he said he would never forget how pot had messed up his life, he was back on marijuana a few months later. In desperation, the parents decided to send him to Florida to live with some relatives and let him work in a gas station and use the drug. While he was there, T.K. beat up a police officer who was attempting to arrest him.

When he returned home after a prolonged stay at the detention home, he could not understand all his previous behavior. "It is as if pot would be controlling me, and I am just doing all these crazy things ordered by something outside my power." The charges in Florida were dropped because officials there felt he was a fine boy and wanted to give him another chance. He returned to school where he attends special education classes for students with adjustment problems. He has promised to stay off drugs but has refused to enroll in a drug treatment center. He is the favorite student of his class, helpful and hard working. His teachers hope that this time he will continue on a drug-free existence. Although he is getting almost straight A grades, he complains that his memory is not as it used to be. He is attending counseling ordered by court.

DISCUSSION

In all my patients, I have observed several recurrent symptoms of marijuana intoxication: a lack of motivation with a concomitant slacking off of school performance, dropping out of extracurricular activities, and perceptible changes in personality. Short-term memory is impaired and the ability to concentrate is diminished. Abstract thinking seems to suffer the most, making mathematical performance especially difficult.

As a result of chronic use, other changes occur. Chronic users often abandon their original life goals, or at least compromise them. Estrangement from the family takes place. Sudden swings of mood, irritability, hostility, and paranoia are common. So are feelings of loneliness, isolation, and depression, in addition to thoughts of suicide, sometimes with elaborate fantasies about ways to do it. Increasing problems with school work, a poor self-image, and decreased interpersonal involvement are frequent. A marked personality change and the use of obscene, abusive language are often reasons for parents to seek counseling. In heavy chronic users one occasionally observes decreased sex drive and problems with sexual performance. Although frequently there is diminished interest in grooming and personal appearance, some chronic marijuana users do not change in these respects. Eating and sleeping habits are altered, and one hears constant complaints of tiredness, coughing, and often chest pains.

The younger the marijuana user, the more serious the consequences. One of the most serious hazards of cannabis use is that the drug prevents users from maturing emotionally and socially. They avoid problems, fail to learn from their previous mistakes, don't face challenges, and do not learn to postpone immediate pleasures for more meaningful and lasting ones. They learn to live now, worrying about neither the past nor the future, neither making plans nor setting goals. They don't learn to experience the satisfaction of personal achievement, friendships, or surmounting difficult obstacles. They settle for a cold chemical experience instead of a warm response to people. An especially vulnerable group of youngsters is those who have emotional or personal problems, whatever their origin. Marijuana use in such individuals may trigger a latent psychotic condition. In my opinion, marijuana-induced or aggravated behavior or psychosis may explain the increasing number of irrational acts and violent crimes of today's youth.

Marijuana in the School: Clinical Observations and Needs

Robert G. Niven, M.D.

INTRODUCTION

The patients forming the basis for the clinical observations presented in this paper were seen over the past several years in a variety of addiction treatment settings. As the director of the Adolescent Drug Abuse Service, an outpatient program in the

Department of Psychiatry at the Mayo Clinic, I see young people under the age of 18 with a variety of drug abuse and chemical dependence problems. This clinic focuses on providing thorough diagnostic evaluation of any child suspected of having a drug problem, with an emphasis on careful clinical history and obtaining and examining all available data, including those from family, school, parole officers, and other agencies with whom the child has been in contact. Physical examination and laboratory testing, including urinalysis for drug use, is done as clinically indicated. Primarily individual and group treatment programs are offered for children and their families, for children in the earlier stages of drug abuse. Followup treatment programs are offered for chemically dependent children who have gone through primary treatment programs on an inpatient basis.

The clinic functions in a community in which there is a high degree of medical sophistication and in which a high percentage of the population is employed in the health care industry. Parents of other children may be employed in the electronics, agriculture, and human service industries, in a rural setting that is culturally and economically stable and in which there are few of the socioeconomic problems present in many large urban populations.

The State of Minnesota is generally considered to be sensitive and sophisticated in regard to substance abuse and chemical dependence problems, and it contains more treatment beds for chemical dependence than any other single State in the country. There generally are very enlightened and progressive policies toward identifying and treating persons having problems secondary to drug use. For example, there is a State law requiring provision for treatment of chemical dependence problems in all group insurance contracts, and many large employers have progressive employee assistance programs that include treatment for drug abuse. The Rochester public and parochial school systems have progressive substance abuse policies and programs; both employ full-time coordinators to deal with such problems of students and staff. Many of the teaching staff of the Rochester public school system have gone through 1- to 2-week intensive training programs to increase their sensitivity to and understanding of substance abuse problems, and to assist them in facilitating identification, intervention, and support for students having drug problems. The Minnesota State High School Athletic Association also has a policy regarding student athlete drug use.

My experience in seeing students in this setting, however, is that this community is not significantly different from many others in terms of the extent of student drug use and the problems associated with such use. In the last few years, there has been a significant increase in the number of students using alcohol, marijuana, and other illicit substances, and there has been a decreasing age of first use. There has been a progressive increase in the number of students identified as having drug-related problems and in the number referred for evaluation or treatment of such problems. With few exceptions, the children referred are white, ages 12 to 18, school students, from intact families, physically healthy, and without major psychopathology except for the effects of the drug use.

While we occasionally see a student who is using marijuana exclusively, the vast majority of our patients have used or are currently using other drugs, most commonly alcohol. Over 85 percent of the students seen in our service who are having problems related to their drug use are using marijuana and/or alcohol almost exclusively. Of those students who do use both drugs, there often is a distinctive pattern of using marijuana on weekdays, and both alcohol and marijuana on weekends. Only a small percentage of the users seen in our clinic use alcohol during the schoolday, in contrast to the high percentage of students in general who use marijuana during the schoolday. Many students we see do not express a particular preference for either of the two, given equal access, and many students also indicate that availability and relative ease of surreptitious use are reasons for their preference for use of marijuana during the week.

MARIJUANA USE AND ACADEMIC PERFORMANCE

The relationship between marijuana use and academic performance is becoming increasingly important as the incidence of marijuana use by young people increases. While it is widely agreed that student drug use, including use of marijuana, is associated with impaired school performance, the precise nature of that relationship remains undetermined. While recognizing that some longitudinal studies demonstrate that poor school performance is an antecedent to marijuana use, in our group of students there is often a clear-cut, close temporal relationship with beginning marijuana use and decreasing school performance as measured in both academic and behavioral terms. Further, there appears to be a decline in such performance both in students who excelled prior to onset of use and in those exhibiting either academic or school behavioral problems prior to onset of use. On numerous occasions, in pursuing the details of onset of marijuana use and its relationship to declining school performance, it becomes clinically apparent that daily use of marijuana can and does lead to a decline in academic performance in many students. In most instances, it is impossible to be certain that this effect is pharmacologic, although it is my personal judgment that in the case of marijuana, the effect is primarily a pharmacologic one. Certainly, the same clinical finding may be seen with extensive use of other drugs and is perhaps in part attributable to a drug-taking lifestyle, to attitudes about school, or to other variables. A decline in academic performance almost universally reverses, with a return to previous achievement levels, upon cessation of marijuana use provided that other drug use is not continued or substituted.

From a clinician's standpoint, there are many questions that need to be answered by future research concerning the relationship between marijuana use and academic achievement. Prominent among these is a definitive answer to the question of whether or not regular marijuana use does impede learning in the typical school setting, either directly or via induced attitudinal or other changes. Second, there is a need to examine the association between labeling drug-using children and academic achievement. If attempts to eliminate problem behavior exhibited by the marijuana-using student and attempts to stop the student from using marijuana are not met with early success, the individual may acquire a variety of pejorative labels that may further impede academic achievement. Further such labels may predispose children to subsequent rejection from the school setting if they exhibit minimal "acting out" behaviors or if they return at any time to drug use. Third, there is a prominent need to educate parents, educators, and health care providers regarding the importance of assessing marijuana and other drug use in all children, so that the contribution of such drug use to the child's problem can be assessed and dealt with appropriately. The effect of other drugs, both alone and in combination with marijuana, and their effect on the educational process also need further research.

THE AMOTIVATIONAL SYNDROME

A related issue concerns the much discussed amotivational syndrome, or, as I call it, the "I don't care syndrome." Whether or not such a syndrome exists, in a clinical setting there appears to be a clear association between initiation of frequent (daily or near-daily) marijuana use and a personality change that in many people contains features of the so-called amotivational syndrome. In general, this change includes an apparent and often-expressed lack of concern about the persons, values, and issues that were previously important to the individual. It is this particular personality change that appears to be one of the most disturbing features of marijuana use to the parents of children seen in our clinic. It appears that this syndrome exists not only when there is acute marijuana ingestion, but also generally when there is regular marijuana use. As is the case with impaired academic performance, the features of the amotivational syndrome may begin to appear shortly after the onset of daily or near daily use, and these personality changes begin to disappear in a matter of a week or two after cessation of marijuana use, although it may require many weeks of abstinence for the syndrome to clear completely. Among the explanations for such behavior is that it is part of the psychological process of becoming dependent on any drug, or that it reflects personality and attitudinal variables not causally related to marijuana use. Based on my personal clinical experience, however, I believe that frequent marijuana use, much more so than any other drug with the possible exception of narcotics, does produce the behaviors noted above and that this is, at least in part, directly related to the pharmacologic effects of the drug.

MARIJUANA USE BY STUDENT ATHLETES

One subgroup of students for whom marijuana use may pose special problems is athletes. Despite a statewide athletic association policy prohibiting nonprescription drug use (including tobacco) and prescribing penalties for use that effectively eliminate students from competition in their sport for the season, drug use by student athletes appears to be extensive and is associated with a variety of clinical problems. (It is my impression, however, that the number of student athletes seen in our service with serious drug abuse or chemical dependence problems is significantly lower than the percentage of nonathletes seen. It is premature to interpret this as meaning that participation in athletics prevents drug use as there are numerous other possible explanations for such a finding, and because student athletes whom we do see uniformly tell us that use is extensive.) A surprising finding is that parents and coaches often enable the drug-using athlete to continue using by denying, minimizing, or rationalizing the use. Occasionally, even those parents or coaches who consciously acknowledge the use and consider it a problem simply refuse to abide by school policies (or the student's best interests).

A problem of great clinical concern is the serious substance abuser, who is chemically dependent, who cannot be engaged in a treatment program, and who is participating in athletics while under the influence of alcohol, marijuana, or other drugs. Marijuana effects known to be pertinent to athletic competition include relaxation, euphoria, perceptual alteration, impaired judgment of time and distance, impaired memory for learning new material, decreased coordination, and at very high doses, tremor, myoclonic muscle jerks, and hyperactive deep tendon reflexes. Also of interest is the effect of marijuana-induced tachycardia in combination with exercise-induced changes in cardiovascular system functioning.

State Athletic Association rules authorize participation in sports for students who are in treatment for a drug abuse problem. Because of this, students who are caught using marijuana often come to our service wanting us to say that they are in treatment for a chemical dependence problem so they can be readmitted to their athletic program. Some of these students are indeed serious drug abusers who are chemically dependent, but some of them are clearly experimenters or social users who are willing to accept the label of chemical dependence in order to participate in athletic activities. Dealing with such manipulative and enabling behaviors in this situation, in my experience, is among the most difficult tasks in the entire field of student drug abuse.

Questions in this area include the following:

1. Is there a difference in the incidence, prevalence, or patterns of drug use by athletes as compared to nonathletes?

2. Are the reasons for use by student athletes different from those of nonathletes? More specifically, do athletes use marijuana to treat performance anxiety?

3. Is there an association between marijuana use and athletic injury or impaired athletic performance? (I hypothesize a positive correlation in both circumstances.)

4. Are the cardiovascular effects of marijuana detrimental or dangerous in the context of athletic performance?

5. Do the policies of the State of Minnesota prevent, delay, or minimize the drug use, abuse, or dependence of student athletes?

6. Does athletic participation in and of itself prevent, delay, or minimize drug use, abuse, or dependence by participants?

MARIJUANA USE BY THE LEARNING-DISABLED OR HYPERACTIVE CHILD

While numerous studies have examined the effects of marijuana on a variety of cognitive functions, there is a paucity of data on the effects of marijuana use on the cognitive functions of learning-disabled or hyperactive children. It would seem reasonable to assume that the learning-disabled, hyperactive, or other cognitively impaired child might be severely affected by any process that impairs cognitive functioning, including marijuana use. Additionally, it is reasonable to ask whether such a child might be more sensitive to such impairments than the normal child in terms of dose effects. Further, on at least two occasions, I have been faced with a history suggesting that marijuana use may have had a paradoxical effect, making the hyperactive child excited, irritable, and exacerbating the hyperactivity, rather than having its usual "mellowing" effect.

Given the frequency of learning disability and hyperactivity in children, a pertinent issue is whether or not such children might be increasingly prone to use and/or abuse drugs such as marijuana in an attempt to relieve the feelings of frustration and low self-esteem almost universally present in these children. These disorders, because they are quite common, would seem to represent a potential source of bias in the outcome of studies examining the relationship of marijuana and other drugs to the educational process. This is a variable that does not appear to have been taken into account in studies done up to now.

There exists, then, the need to study the effects of marijuana on the behavior and the cognitive functions of hyperactive and learning-disabled children in an attempt to discern whether the effects on them are different, and if so, whether the differences are beneficial or detrimental. We also need to ascertain whether or not these children are more likely to use or abuse marijuana. In my judgment, until the answers to these questions are in, it is clinically appropriate to consider marijuana use by such children as strictly contraindicated (although I feel compelled to add, as a value judgment on my part, that any nonmedical psychoactive drug use in children is contraindicated).

Finally, attention needs to be paid to assessing the presence or absence of a learning disability in children in treatment for drug abuse, in order that an undiscovered learning disorder does not adversely affect the delivery of treatment and the subsequent recovery of the child.

MARIJUANA DEPENDENCE

Clinically there is no doubt that psychological dependence on marijuana can and does occur. Although we rarely see marijuana used alone, it is the drug of choice of many of the adolescents in our clinic. Given free choice between using marijuana or other central nervous system depressants, most will choose marijuana. Those who do not appear to have strong preferences may substitute other drugs (particularly alcohol) if marijuana is not available. Symptoms of psychological dependence parallel those seen in classic adult-onset alcoholism, and, in fact, such a model seems to serve very well for marijuana dependence. Symptoms such as increasing use to the point of tolerance, solitary use, surreptitious use, symptomatic use, blackouts, personality change when intoxicated, inability to control the amount used, preoccupation with use, inappropriate use, and use despite adverse consequences are seen regularly in our adolescent patients. Fortunately, many of the adverse physiologic effects noted with excessive and inappropriate alcohol consumption are not present with marijuana use, but almost all of the other adverse consequences that can be seen with alcoholism are noted with marijuana dependence. Further, although I have not yet seen an unequivocal case of pure marijuana abstinence syndrome, I remain concerned that such a syndrome does exist in mild form. I have seen several individuals who describe irritability, anorexia, insomnia, and intensive drug-seeking behavior upon cessation of heavy marijuana use. One of these individuals reported such symptoms on several occasions and noted relief of them by return to marijuana or alcohol use.

It is imperative that we gather more data about both psychological and possible physiological dependence on marijuana. This issue is of major importance, not only in terms of providing appropriate clinical care to individuals, but because of important implications for public policy regarding marijuana use.

OTHER CLINICAL ISSUES

From a clinical standpoint, it appears essential to treat drug abuse and chemical dependence when they exist in association with other problems, regardless of any cause-and-effect relationship between the drug use and the other problems. It is my clinical experience that treatment directed at other psychopathology is almost always ineffective in drug-abusing or chemically dependent children, just as it is in the adult if the drug use continues. This is a major clinical issue, as many children are referred to pediatricians, child psychiatrists, and other child health care workers for problematic behaviors, and the child is not initially recognized as an extensive marijuana user. This may occur either because health care personnel often do not inquire about such drug use, or if they do inquire about it, the child will minimize the extent of use and/or the caregiver may not be aware of or may minimize the significance of such use.

Space does not permit thorough discussion of many important clinical issues associated with marijuana use in children, but I would like briefly to identify some problem areas of importance in my clinical practice.

First, there is extensive enabling behavior, of both an active and a passive nature, among many school officials, parents, and some professionals who deal with children. There appears to be a need for research and education regarding this behavior if we are to increase our effectiveness in identifying those individuals whose drug use is problematic and in intervening as early as possible.

Second, while there is much research on the effect of marijuana on reproductive physiology, there is a paucity of research on the relationship between marijuana use and sexual behavior. In our clinic, patients of both sexes often use marijuana prior to engaging in sexual intercourse. Although many of these individuals claim that they do this in order to enhance the sexual experience, it is my belief that it is often an attempt to treat attendant anxiety or guilt related to their sexual behavior. Further, females who are psychologically dependent on marijuana sometimes prostitute themselves in order to get high. Recognition that they are having sex in order to get marijuana is usually associated with much guilt and seems to lead to further marijuana use or other drug use in an attempt to alleviate this guilt.

There is a need for more research on the accuracy of clinical histories and for the development of better tools to accurately characterize the extent of marijuana and other drug use in children so that we can identify those children who may be exaggerating their drug use as well as those who may be minimizing it. In our experience, it is not uncommon for children to exaggerate their use and/or to seek the label of chemical dependence apparently because they view this as a status symbol.

Finally, technological advances aiding the identification of marijuana or its metabolites in urine or expired air would be of great value to the clinician treating the marijuana abuser. We need enhanced qualitative and quantitative analytical techniques to assist in the identification and confrontation of marijuana abusers.

CONCLUSION

Marijuana, because of its ready availability, relatively low price, and high acceptance by our young people, appears to be associated with an increasing incidence of a variety of problems in adolescents. While I personally have no doubt that marijuana in and of itself is potentially a very dangerous drug for young people to use, I firmly believe that we have nothing to gain and a lot to lose by overinterpreting or overgeneralizing from clinical observations. It is imperative that we avoid a return to the scare tactics and harsh legal proscriptions of previous eras in our attempts to deal with marijuana use today.

Discussion Highlights: Lanter/Niven

Smith: I'm going to underscore a very important point that Dr. Niven made. That is, our solutions sometimes create more problems than they solve. The amotivational syndrome of young people who are arrested, jailed, criminalized, and homosexually raped in jail because of marijuana use demonstrates that the legal solution is worse than the drug use. Some of the procedures used in the past are more damaging to the health of young people than the drug use could be.

Dr. Lantner, I agree with your conclusions about the early onset of marijuana use impairing psychosocial development. But in another presentation you said that paranoia with the adverse marijuana reaction was only situational. Can you comment on that point?

Lantner: In some cases paranoia will be situational, but I disagree, and have never said, that it's only situational. On many occasions, my patients have experienced this feeling in a safe environment, while alone, or with their best friends. I believe the pharmacology, and perhaps the strength of the particular sample, is responsible for paranoia in certain people.

Smith: Although this is rare, you can have a toxic psychosis with paranoid characteristics that is pharmacological in nature. The opposite question would be, do you believe that the marijuana reaction is not influenced by psychological and social setting?

Lantner: It might be that influencing the setting has some bearing on the whole, but I really believe the drug elicits certain reactions.

Smith: I agree with that, but I feel very strongly that you have to look at the pharmacological variable as well as the psychological set and social setting. The drug in and of itself can have toxic consequences that have paranoid characteristics. But the reaction to any of these drugs is strongly influenced by the social setting in which the drug is taken and the psychological set of the individual who uses it.

Lantner: I feel strongly that the pharmacology of the drug has more to do with the reaction of the user.

Voth: I would like to go over a couple of points. With continued use of marijuana, youngsters just come apart, deteriorate, and become very sick. There is a difference between manifest illness and latent illness, and that's a psychological reality. We know that people carry substantial psychopathology in the depths of their minds only to have it triggered by one chemical or another, including marijuana.

It is public knowledge that our existing law enforcement efforts are not stemming the tide of marijuana use. As responsible parents must take care of their children, a responsible government must take care of its citizens if they themselves can't do so. You can hire more marshalls, or you can increase Coast Guard personnel, or you can use underutilized military personnel. I am not for a police state situation, and I hope everyone understands that, but I think we are in a crisis.

Niven: History proves to us that a police state does not work, and I am not aware of any government that rid itself of the drug problem no matter what it did.

Cohen: Dr. Lantner, do you notice that the cases in your paper are exactly the opposite of what Dr. Fishman described to us? Your patients came from well-structured, stable, loving families, and Dr. Fishman blames unstable family relationships. Will you comment?

Lantner: Yes, but I don't think Dr. Fishman and I disagree. There is certainly a more vulnerable group of people who would be tempted to use drugs. Dr. Fishman describes them. Being in a regular pediatric practice, I am bound to see different types of patients. From these I purposely chose the cases without any previous personal or family problems. I hoped to illustrate that marijuana use can create certain symptoms and problems that did not exist before, or after discontinuation of the drug.

Fishman: We all tend to see what we look for. One can use any number of lenses to examine clinical material. Dr. Lantner, you use one lens for the justification of your theory. I use another lens or perspective to justify my theory.

Lantner: Do you believe, Dr. Fishman, that most children who have family problems eventually use drugs as an escape, and that marijuana use is only a symptom in all children? I am convinced that its continued use will gradually create some problems in any individual I am also convinced that many children use marijuana not to escape their reality but because they enjoy the feeling of the high.

Fishman: I believe children live in contexts, and that social context determines how vulnerable a child is to drug-seeking behaviors. Dysfunction in the context determines the child's vulnerability to serious drug use.

Durell: Yes, of course. But I fear we are generating another unnecessary dichotomy. I don't see why we can't acknowledge that in the presence of disorganizing family factors the use of drugs would be greater, and that in more healthy families the use of drugs in and of itself may induce symptoms. I don't see any incompatibility between those premises.

Fishman: We need to decide whether mild use of marijuana is dangerous. This is very controversial and, to my mind, the empirical evidence is simply not there. Heavy use, on the other hand, is widely accepted as bad for teens. It is with this group of youngsters that I advocate emphasizing the factors that increase the vulnerability to heavy use--not the drug supply, since both groups tend to have equal access to this ubiquitous substance, but the presence of family dysfunction.

Durell: The observation that Dr. Lantner made regarding the possibility of subtle cognitive changes, particularly memory defects in weekend and occasional users, seems to me to be a very important clinical observation. I wonder whether other people have observations that would support this. If so, it suggests a carefully controlled study that could be done to document, with neuropsychological tests, such changes in occasional users.

Macdonald: Dr. Lantner's case reports fit perfectly into the framework I presented of behavioral changes associated with progression into the world of drugs. I have heard literally hundreds of young people recite similar stories. Pediatricians have a different perspective on children than psychiatrists do. We see them from birth and spend approximately half our time with them in well-child visits. We get to know the families over long periods of time in sickness and in health and through many developmental changes. We have come to recognize normal adolescent changes and from this perspective see the new epidemic of children whose behavior is inconsistent with growing into successful adult functioning. Psychiatrists, on the other hand, tend to see children after they have problems of sufficient degree to seek help or have help sought for them. Their view of the normal adolescent may have a bias toward the aberrant.

Niven: I would like to respond to Dr. Durell because I also see kids who are apparently normal prior to their drug use, and who return to normality once they discontinue the use of drugs. In almost all of the young people I see who have a cognitive impairment secondary to drug use (whether it is marijuana or other psychoactive drugs), that cognitive impairment disappears in a matter of weeks at best. In my clinical experience, I have not seen any case in which I could conclude there was long-term memory impairment as the result of marijuana use. Further, I occasionally see youngsters who use drug use as a rationalization for problems in their life that have other etiologies. For example, I recently worked with a student athlete who blamed his poor athletic performance on marijuana use when all of the evidence indicated that he simply wasn't good in that sport.

DuPont: I would like to add another perspective that perhaps has been discussed earlier--the question of message. What constitutes the message that gets across to the public in terms of public education? How does the kind of discussion we're having relate to public messages? The observation I would like to make is that messages to the public generally are presented in a primary process fashion. That is, it is difficult to get across public communication as subtle and sophisticated as the phenomena we're describing. One is constantly confronted with the need, in terms of public communication, for simplifying messages. Any time you talk about evidence that there are a substantial number of marijuana smokers who are not harmed by their use, you are giving a message that is perceived by large numbers of potential and current marijuana users as permission, if not encouragement, for very heavy use. I'll point out, and I'm sure it is obvious to most of you, the difference in societal messages we have about cigarette smoking and drinking. With drinking, we are talking about a model of responsible alcohol use. Social drinking is defined as normative behavior. With cigarettes, however, we define abstinence as the goal. There is no compromise on that point. We don't talk about cigarette smokers who "get away with it." All the people who are talking in the field of cigarettes, it seems to me, have a very clear message, and that message has a direct translation into behavior. If we give clear messages to people about smoking, then a person who chooses to smoke will do it with full, reinforced knowledge of the health consequences and not with illusions or false hope.

There is an attempt on the part of the parents' movement to blur the issue by focusing on young people, when it turns out that everybody is against their using marijuana, or, for that matter, any psychoactive drug. But there remains the uncomfortable issue of adult drug or alcohol use. If you can deal with the adult use of marijuana, what about the adult use of alcohol? What is the message to a child who sees a family that uses an intoxicant (i.e., alcohol) on a universal basis to relax and have fun? I hear from young people all the time, "Well, if it's good for the parents, it's good for me." The more you think about it, the more you raise the question about adult drug use and intoxication.

It is striking to me, and Dr. Niven referred to this, that there exists an incredible contrast between a literature that is not responsive to the clinician's concerns and that is also misleading from my point of view, on the one hand, and the clinical experience that is so overwhelmingly clear on the other hand. A study recently released and reported in the Washington Post concluded that college students who use drugs of all kinds, including heavy users, were virtually undistinguishable from nonusers on the basis of school performance and other variables. That widespread and so-called credible study is mind boggling when at the same time you can talk to users who may or may not feel that the use of drugs is affecting them, but who all agree that it affects the general user.

This relates to a worry that I have. Some of you know about the National Academy of Sciences study that is going on. The concern I have about that study and related studies is very simple: We will get another round of observations that we don't know enough, that we have more questions than answers. The problem with that kind of finding is the reinforcement of the "permission" to use drugs that I mentioned earlier.

Finally, it is striking from Lloyd Johnston's most recent data that there has been a downturn of daily marijuana use in the last 2 years. The peak occurred in 1978 when 10.7 percent of high school seniors reported daily marijuana use; now it's down to 9.1 percent. What reversed a trend measured since 1975? There is pretty good evidence that the major reason it happened was the increased knowledge and awareness of the health hazards of marijuana use. Again, I urge us to think about tobacco as an analogy because here there is a clear message being issued to the public. Moreover, marijuana use looks more like tobacco use than it does like alcohol use, that is, in the tendency to go toward daily use. Again referring to the Johnston data, you find that among high school seniors only 9 percent of current drinkers are daily drinkers, 58 percent of current cigarette smokers are daily smokers, and 30 percent of current marijuana users are daily users. I think there must be a very tough, clear, unambiguous message. Messages that come across as "on the one hand and then on the other hand" are ineffective.

Cohen: On the basis of information theory, I think you are probably right when you say the message has to be clear, tough, and simple. On the other hand, I have a good deal of trouble with that when I realize that if it's that clear, it can't be true.

Durell: The message can be true. That is, I think we can deliver a message in which there are no inaccurate statements. We would probably choose to omit some of the items of information that were discussed today with the rationale that if we included all of the bits of information the results would become a meaningless message to the average receiver. It is, perhaps, a paradox that there is no possible way to deliver a "true message," if by that is meant a message that contains all of the bits of information that we have available to us.

Halikas: Why can't we say that for those in the population under the age of 18 we will reinforce all social prohibitions against use of alcohol, tobacco, and marijuana?

Lantner: Why can't we say that marijuana is a health hazard, as we are saying with tobacco? We certainly can't say marijuana is less a health hazard than tobacco without specifying an age limit. What bothers me about the age limit is that in my experience the adults in families who use marijuana do give marijuana to younger children; this frequently occurs. So we should not encourage the use of marijuana by adults.

Voth: At a meeting at the Pentagon recently, I was presented with data that showed that 45 percent of our service people at the enlisted level have taken drugs, mostly marijuana. In light of this I don't think we should limit our focus just to youngsters at all. I think it should follow along the lines of the tobacco message.

Niven: I wish to comment again about information transmission. I think it is virtually impossible to deliver a message to someone about drugs as an isolated event.

A classic example of this has to do with our attempts to deal with PCP use. If we give youngsters a simple message that PCP use can make them crazy but they are at a rock concert where thousands of others around them are using PCP and not going crazy, I am pretty sure they will pay more attention to the latter message. I think we need to take this kind of incident into account. I personally believe that we do a great disservice by oversimplifying the messages we attempt to deliver about drug use.

Perhaps if we laid out all of the information we have about marijuana use, it would be more effective. I have had kids come and talk to me about papers they have read about marijuana, and by and large the children I work with know an awful lot more about marijuana use than their parents do. I don't know if this would be any more effective than our current approach is, but I do believe that attempts to oversimplify messages have been a problem.

Smith: Oversimplification and authoritarian messages certainly don't work in a clinical situation. Full consumer education, as Dr. Niven described, is the only thing that works with young people. Your question is, do oversimplification or authoritarian messages work in the media? This leads into the realm of opinion, particularly when we start debating about what the truth is. I think there are certain things we can agree on, but when we go beyond that, we end up in debate about which truth is going to be accepted.

Durell: When we don't simplify the message, the media simplifies it for us. That is, the media reduces the message to "Scientists say that marijuana is dangerous," or "Scientists say marijuana is harmless," or "Scientists are confused." Those are the three basic messages the media projects; if we don't decide which of the three is closest to the facts and structure our communication to encourage that conclusion, they decide for us--and often don't do a very good job.

I thought Dr. DuPont made a very important point when he discussed the difference between alcohol and tobacco in terms of the message and its relationship to the use pattern. I would like to reiterate that from a slightly different point of view. I think the pattern is also related to the pharmacology of the drug and the way in which dependence develops. Indeed, very few cigarette smokers would have any interest in smoking an amount that would not have a significant health effect. This seems to be related to the pharmacology of cigarettes. Surely we know people who smoke an occasional cigarette, but by and large that doesn't appear to be the general interest of the public.

Cohen: Before you respond, Dr. DuPont, I'd like to ask you a question. In the case of a drug like marijuana, where nobody is dying in the streets and nobody sees a corpse, how are you going to be convincing about the dangers of marijuana 20 to 30 years hence? Now, it is true that amotivational syndrome might develop in months. But aside from the very rare acute reactions, you don't see anybody lying on the floor. Will you comment, please?

DuPont: One of the problems of communicating about a drug experience is that the consequences are both uncertain and delayed. Because of that it becomes very difficult to communicate clearly. One of the things I have done while talking with young people is essentially to worry them on a point they haven't worried about as yet. And that is, they believe as individuals that they can control their drug use; they accept that it could be a problem, but they believe they control it. What I say to them is, "You might be wrong about that, and there's good evidence that a large number of you are wrong." One of the statistics I like to use concerns cigarettes. I say to them that in the American population today half of the people who have smoked as much as one pack of cigarettes are currently dependent on cigarettes. So, if you are talking about risks, there is a very big risk. Then I talk to them about alcohol. Alcohol is not as addicting as cigarettes; only about 10 percent of alcohol drinkers become alcoholic. There is no way for either the expert or the individual to predict which drinkers will become alcoholic and which smokers will become dependent. The problem with the dependence syndrome is that it sneaks up on you in such a way that you will perceive yourself as continually making choices and having control until very late in the process. I tell them they should think about this as they are going through the experience of making choices.

I ask them to talk to adults they know about their cigarette habits because that's the most public addiction. That's the only one they can see clearly. I ask kids to ask adults: "When did you start to smoke?" "Why did you start to smoke?" "Did you think you'd get addicted?" "How long did it take to get addicted?" "What is it like now?" "Would you like to stop?" "Have you tried to stop?" These questions help kids to become educated about the pharmacological control of their behavior. And I say that's just the beginning of control. I also say that drugs make liars out of people so they don't know themselves what the effect of the drug is. I tell them, "If you're concerned about your use, don't ask yourself because you won't know. Ask your friends who are not using what they saw in you before you started taking drugs and what they see in you now. That's the only way you're going to get reliable information. You may try to dismiss it because you will not want to know the answer, but that's the way you'll find the information. You are not a reliable witness." That is frightening to kids because it suggests that they really don't have control. I agree with Dr. Lantner that the pharmacology of these drugs for most, but not all, people is enormously important in terms of changing their behavior, their thinking, and their whole lives.

Chapter 6

Highlights of Final Discussion

Durell: Too often in our data-oriented culture, the importance of clinical observations in advancing knowledge is neglected. Several of the participants stressed the limitations in the validity of clinical observations. Certainly, such limitations exist, and such observations are best considered "hypothesis generating" from a rigorous standpoint. But we must not underestimate the difficulty and inherent limitation of more rigorous data-oriented studies in arriving at conclusions of real relevance to health care. The skilled clinical observer can often reach conclusions that may take many years to achieve scientific validation. Of course, sometimes clinicians are wrong in the conclusions they draw. We often have no reasonable choice, however, other than to approach problems on the basis of knowledge generated from careful clinical observations. Similarly, I believe the clinical observations we have discussed today are so compelling that we have no reasonable choice but to devote maximal effort to preventing marijuana and other drug use and abuse by children and adolescents.

Several participants were concerned about whether the syndromes described are specific to marijuana. Though it would be interesting to systematize the data on that question, I don't think we have to say that the effects we are describing are unique to marijuana in order for them to be important. Perhaps we do not have enough information to allow us to make fine discriminations regarding what marijuana does and what amphetamines do, or what the chronic use of cocaine does, or the chronic use of alcohol. We can't make all of these very fine distinctions, but we can say that the use of psychoactive substances by our youthful population seems to result in a characteristic behavior pattern or syndrome. For our purposes, however, it may not be necessary to define just what role marijuana, as opposed to other drugs and personality factors, plays in causing the syndrome. The conclusion, however, which I thought we agreed on completely, was that, just as in alcoholism, the approach that seems to be most effective clinically is the abstinence model. You can't be very helpful by advising, "Use the drug carefully and responsibly and you'll be okay." You surely can't say that to people in trouble who are coming to clinicians. I think this item of consensus is very clear even though there are other areas on which we disagree.

The other issue I heard stated several times is one I would expect from clinicians: "You can do more harm than good if you're not careful." We at the National Institute on Drug Abuse are very sensitive to that danger and will heed that advice. Sometimes the concern has led us to deliver a neutral, dispassionate summary of all of the data without any clear conclusion. In my opinion, that results in the harm of omission. By the time such reports are processed by the media, the message is that scientists are confused and they can't agree about the effects of marijuana. This is taken by people to mean that there isn't any clear reason not to use it. This harm, the harm of omission, is one we must take as much care to avoid as the harm of making overstatements that "pollute the information atmosphere," to quote Dr. Smith. I hope these discussions will help each of us walk a delicate tightrope--remaining accurate and objective but not failing to exert influence where we can and should take a stand!

Cohen: I have one regret about this meeting, and that is that we did not have a clinician who found marijuana either harmless or beneficial.

Voth: I think I have heard here today enormous support for the beliefs I have formed over the last 10 years. I think marijuana is harmful, particularly to the young and emotionally vulnerable. I think it's time to make a position statement that is clean and unambiguous. I think from the clinical observations presented here it is overwhelmingly clear that marijuana does damage.

Fishman: The question at this point is, what kind of message do we convey on the basis of this meeting? I thought about Gregory Bateson's statement that "information is a difference that makes the difference." Certainly, there is literature both pro and con for marijuana. If we, as experts, come out one more time condemning marijuana use, I don't think it will have enough intensity to make a difference. It would be more of the same. Why not direct the message to the family rather than to the children? And the message should be twofold. First, that marijuana may or may not be dangerous. Sufficient evidence, especially concerning long-term effects, is not in. Just how innocuous or dangerous marijuana is, is a value judgment that at this point must be made by the family. Furthermore, the family must live with the consequences of this decision--in terms of implementation as well as long-term sequelae, if any. Let's share with the families the one point that we all seem to agree on. We are worried. All the news is not in, and we fear recent reports that are ominous. And then, let's place the onus where it truly belongs--on the family. The Government should facilitate, not undermine, the family's role as the youngster's caretaker.

A message such as this would underline the importance of the family and challenge the increasing reliance of families on other institutions, especially the Government, to assume difficult tasks vis à vis their children. Finally, if the family cannot implement its decision and the teen is using marijuana heavily, then the problem is not just the child's. It is the family's problem. The entire unit, not just the youngster, is in trouble. A message such as this, which puts the burden of decision, enforcement, and, if necessary, cure, on the family, would be novel. Coming from this group, it just might be different enough to actually make a difference.

Niven: I see several points of consensus. There seems to be a consensus that marjuana has the potential to harm people in some situations, and it seems clear that people can become psychologically dependent upon it. I see our differences as being quantitative in nature rather than qualitative. I disagree with Dr. Durell on the point of projecting a simple and unambiguous message because the issue is not simple and unambiguous. I personally see nothing wrong with saying that to the public. I think we greatly underestimate the ability of people to perceive that scientists don't agree on this issue, and that is the reality and truth of it. I also disagree with Dr. Durell on the specificity of marijuana effects. I think the more we know, the better we can care for our patients. We need to know the specific effects not only of marijuana but of every drug. I agree that clinical observations certainly do have their limitations. I made my comments because I had a feeling that in this meeting clinical observations may be overvalued. As a clinician, I would like to think that my observations are 100 percent accurate, but I am keenly aware of their limitations. I think the history of marijuana use points out some of the problems of clinical observations. Marijuana has been used for any number of things based on clinical observations, and today none of the things it was previously used for are felt to be valid. Clinical observations are important, but they need to be studied and tested whenever possible. We all see what we want to see and hear what we want to hear, and I think this has been apparent at this meeting.

Petersen: I'm compelled to point out that even though clinical observations have their limitations, they have important strengths also. We would never have found out about tobacco if it weren't for some sure clinical observation. Clinical observation can be useful scientifically. Obviously, science has some serious limitations also, the most serious being that we miss certain things under the lamppost we're not looking for. Unfortunately, before we do make the observation, it may take 20 to 30 years to accrue adequate epidemiological evidence with respect to marijuana use. It may take that long to adequately observe the psychological consequences of marijuana use.

It is thought provoking to realize that it was from 1914 to 1964, a period of 50 years, before we could unambiguously come out against cigarette smoking. It is something we at NIDA ask ourselves on a continuing basis. What do you do by way of dealing honestly with a science and, at the same time, clinical observation, when there are some people who are vulnerable, but you can't say who and under what circumstances? That's a very difficult problem.

Lantner: I feel that marijuana is a health hazard and I don't believe anyone around the table has any question about that. Physicians should get involved with the health issues of marijuana use and leave the moral, ethical, and legal issues to the legal profession. Even though there is research still going on, I feel we have enough evidence to educate children from kindergarten up about the known health hazards of marijuana. This should happen now. If we wait, we lose two or three generations as we did with tobacco, where we have to try to undo a problem started years ago.

DuPont: I agree with Dr. Fishman that focusing in on the family and what the family's responsibilities are is very appropriate. I would call our attention to the fact that this is not only a matter of what adults do to their children in families. Young people have a lot to say to adults about drug use also. Much of adult drug-using behavior, particularly that involving tobacco and alcohol, is influenced in a positive way by young people. It is important to emphasize the family system as a way of preventing drug abuse, and also of dealing with dysfunctional or problem drug use. For the very reason I talked about, I think the user, of whatever age, is often oblivious to and denies the consequences of the use. The most painful hurt comes in the family. The family, by reacting to that hurt, can often make an enormous difference in expressing the serious effect of the drug on health and family life. It is by being isolated from a sense of rootedness that one is uniquely vulnerable to drug experiences at any age; that includes middle-aged people, not just young people.

Senator Mathias held hearings a year and a half ago at which several of us gave testimony. He had all the NORML doctors there, too, so the group wasn't skewed. The Senator made an extra effort to try to balance the group in every way he could. He found two points everyone agreed on. The first point was that marijuana is harmful. Nobody testified otherwise. The second point is that they all supported programs to discourage and dissuade youngsters from using all drugs, including marijuana. So when we're talking about message, it seems to me that it is very clear and can be very simple.

I agree with Dr. Lantner that it is important for us to focus on health issues. What society needs is a clearer message about health issues; these trigger societal response. The failure to grapple with health issues is paralyzing to other mechanisms within the society.

I think there are two major approaches to behavioral control or behavioral shaping on our society or any society. One is religion and the other is law. Many of us have become very sophisticated and are uncomfortable with both approaches. But the fact of the matter is that, when you talk about how behaviors are controlled in societies, religion and law are the most powerful shaping forces in terms of real populations. I think it is very important for us, even if we don't agree with these approaches, at least to provide our testimony about the health effects of marijuana and then respect the processes of homeostasis within the community. For example, I am not a Seventh Day Adventist, but I have a lot of respect for how they approach drug problems. So I think we can recognize that society is going to deal with the information we're giving by a process of open exchange within a democratic society. We are not talking about a totalitarian system. What the public wants from us is clear statements on health issues.

Smith: It is important for us and the National Institute on Drug Abuse to move toward objective assessment of marijuana abuse, particularly as it relates to young people, and objective guidelines that can be used by the clinician, client, and family. To do so will require as much objective clinical assessment of the dysfunction as possible to understand the interrelationship of the variables and the population we are talking about. We need first to define pharmacological variables as much as possible in relationship to dysfunction. Then we need to assess other variables so they can be translated into meaningful clinical guidelines for those of us who work with patients and families in dealing with individual marijuana abuse. Second, it is terribly important that we have more objective research and less subjective opinion of the epidemiology of these patterns. I recommend additional research such as that conducted by Dr. Halikas. We can agree on clinical toxicity and abuse patterns. I think we need to have a stronger foundation for our epidemiological and public health assessment.

Third, as a scientist, I have great concern for what goes on in this building relative to standards for marijuana side effects. For example, when I'm sitting on the FDA Controlled Substances Advisory Committee to assess the therapeutic effects of marijuana, I see a much more precise clinical standard being used to assess marijuana's side effects. There is a difference in standards when you talk about the side effects of marijuana as a therapeutic agent versus a social/recreational agent. It is the same chemical.

Fourth, it is very easy to terrorize a parent. I find some actions that are going on to be irresponsible. They play up irrational fears that all of us parents have about what is going to happen when our children enter adolescence, and very often things are taken out of context as being marijuana specific, rather than being in a range of potential drug hazards.

We all have concerns or problems with the media. I think the only thing we can do is to release truthful information; you can't control what the media does with it after that, and I think it is important that this Institute be as accurate and truthful as possible.

For example, I work with parents' groups who want to hear information specific to marijuana but nothing about alcohol and tobacco abuse. They often suppress the information about the therapeutic uses of marijuana. The suppression of information is very irresponsible. If the information is correct, then it should be released. I think also that the information released will have an impact on the clinician. When it's aimed at one segment of the population, it may affect and may interfere with the entire doctor-patient-family dynamic. So I think the Institute has a responsibility to release accurate, truthful information and realize it will have an impact on a variety of settings in the real world.

Macdonald: I guess I come from a position of terror. I think parents have a right to be in terror. I am certainly not for incarcerating youngsters for 3 to 6 years. However, I think we're in the midst of a major epidemic, and in 5 years it may hit the psychiatrists.

Smith: Are you suggesting that I don't deal with drug abuse and drug death? I deal with drug death every day. However, I still feel the objective, honest approach is the ethical one, and most effective for prevention and treatment.

Macdonald: All I'm saying is that I think parents have a right to feel terror because they are seeing their kids being destroyed. I don't like the tone I perceive here of having to protect children from their parents. Parents need all the help they can get. They need facts about harmful effects, signs and symptoms, prevention techniques, and, where all else fails, treatment resources. I don't think we should make statements that are not true, but we do need to state that the incidence of drug dependence and drug problems is escalating, that drugs are in fashion, and that we are seeing bad results in terms of falling Scholastic Aptitude Test scores, families breaking up, and much more. I am really concerned and do understand parents who live in terror. I want to give a strong message to those parents who have a right to be worried.

A difficult thing about being a parent is that you deal with a child whom you must eventually turn loose, able to make his or her own decisions. You don't want to continually have to tell the child to "do this" and "don't do that." Our understanding of such issues as parental responsibility, children's rights, confidentiality, and others related to responsible parenting are very much in flux. Parents need to give their children very clear messages about how they feel about God, drugs, sex, etc. I believe that parents have not done this well and instead have given either no message or an ambivalent one. I believe pediatricians have to help parents in the guidance of their children in these and other areas. That's why I lean toward Dr. DuPont's relatively simplistic but not inaccurate statement that says drugs are bad for young people and should not be used.

Milman: I have developed some new thoughts since listening to the panelists today and will try to reconcile some of the differences that have been expressed. Some of the divergences have to do with the differences in reported populations. Drs. Lantner, Meeks, Macdonald, and I are speaking from a substantial but exclusive experience with children and adolescents. Drs. Voth, Halikas, and Cohen, on the other hand, have had most of their experience with adults, deriving their knowledge of younger people from secondary sources. Dr. Smith's population is less clearly defined and, from the point of view of the child and adolescent specialist, skewed and unrepresentative.

Another problem, in my view, has been an undue preoccupation with the amotivational syndrome. It is a well-observed effect but probably not a syndrome in the strictest sense. It is more likely a manifestation of the depressive/dysphoric effects of the drug and appears in children and adolescents as the so-called burnout. While the idea of an amotivational syndrome has captured the attention of many observers, it should not divert us from basic neuropsychological derangements such as impairment of memory, learning, verbal fluency, mood, and attention, as well as psychopathological manifestations such as depression, paranoia, hostility, flashback, depersonalization, derealization, and acute and chronic psychosis.

In the past I have avoided relating or equating marijuana to tobacco or alcohol, but I think certain parallels can be drawn that will assist us in dealing with the ambiguities of the marijuana problem. There are parallels between marijuana and tobacco and also between marijuana and alcohol, which may simplify the public health issue, the issue that really concerns this Institute. Tobacco was used for 300 years and more in the American experience before its health hazards were appreciated. It has taken another 30 years to satisfy the Tobacco Institute and the public health community that the hazards are real, yet we are still struggling to convince the public at large. Only very recently have we appreciated the effects of tobacco on the fetus and on the so-called passive smoker. There are many similarities to marijuana in the tobacco experience. A paper was presented at a meeting of the American Pediatric Society in April 1981 by a group from Boston City Hospital implicating maternal marijuana use as a factor apparently contributing more to fetal growth retardation than alcohol. This report plus our finding of dysmorphogenesis at Kings County Hospital draws a parallel between marijuana and alcohol. This same parallel can be drawn in regard to the central nervous system effects of marijuana and alcohol, where both drugs produce measurable, replicable neuropsychological changes, both acute and chronic. Finally, there may be as yet unknown effects of long-term marijuana use that will require a generation or more to become manifest, leading us again to the tobacco analogy. I think if we focus on these public health issues we can formulate a statement upon which we can all agree.

Halikas: There is no basis for us to give permission to selective drug use (e.g., alcohol, marijuana, tobacco) in any age group. I think we shouldn't be ashamed as physicians to be neoprohibitionists. We certainly are not afraid of this in a prenatal setting even when we fall short of that almost religious goal ourselves.

Second, there are two points that Dr. Lantner and Dr. Macdonald both made in their papers in the beginning of their presentations. That is, as pediatricians they didn't start finding marijuana use until they started looking for it; it is something that is so often missed.

Dr. Lantner gave us a very nice clinical description in her paper. I think we should encourage adequate clinical descriptions of cases rather than conclusions.

It could be that the incidence of marijuana dependency or amotivational syndrome is really indeed far smaller than the 3 percent or 5 percent that has come up in my studies or in other studies. Considering the amount of marijuana used in the last decade in this country, it may be an immensely benign drug for most people. We need not be afraid of those numbers; the problem is that there are people who have consequences from marijuana just as there are people who have problems from their alcohol use.

In 1974-1975 my colleagues and I designed a study that was to take prepubescent children in three geographic centers, follow them through puberty with annual physical exams, blood drawings, and psychometrics, observe asocial activity and marijuana use as it began, and follow through to 1981. We would have had those results and would have been able to say what the impact of marijuana is on the pubescent organism from one-time experimentation to chronic use. That project was not funded because of its $1.2 million price tag. It would probably cost twice that to do the study now. In conclusion, I think we can agree on a motion or resolution that we stand behind all attempts to reinforce social prohibition of adolescent use of marijuana, tobacco, and alcohol. I would like to put that before the table.

Cohen: We won't put that on the table because we are not a body of decisionmakers. As you were making your concluding remarks, I was wondering what a reporter would say about this meeting. I decided it would be "Fetal Cannabis Syndrome Discovered."

I think that one important point made during the meeting is that those youngsters who stopped using marijuana should be studied to try to understand their reasons for doing so, and this may help us understand why others continue to use marijuana. We can then use this information to help others discontinue their use of marijuana.

There was a great deal said about authoritarian versus rational information. By authoritarian information I mean something said in an absolute fashion rather than in a qualified fashion to the public, the press, and even to professionals. I can't totally agree with the authoritarian approach; my whole belief has been to be as honest as I can. I remember that only 3 percent of smokers get lung cancer, and that means we are warning all smokers that they could get lung cancer, but it won't be true for 97 percent of them. So you see what the dilemma is.

Chapter 7

Summary and Conclusions

Sidney Cohen, M.D.

This workgroup has been held to obtain additional information on the impact of cannabis upon adolescents. The proceedings contain clinical materials that do not appear elsewhere. Although differences of emphasis and perspective among the conferees are apparent, all agreed that the consistent use of the drug by preadolescents and adolescents can adversely affect mental functioning. Their opinions about the existence of a cannabis amotivational syndrome also coincided. They differ, however, in estimating its frequency. Some believe that the full-blown syndrome or a lesser level of amotivation is not uncommon in heavily using juveniles. Others have the impression that it is an infrequent event and may be expressed in predisposed young people.

The differential diagnosis includes adolescent depression in a youngster who also happens to smoke marijuana. Other central nervous system depressants, aside from cannabis, can also produce a similar impairment of motivation.

It is noteworthy how frequently clinicians are finding marijuana a primary or contributory cause of the amotivational syndrome these days. The improvement that follows upon a discontinuation of the drug is supportive evidence for the causal relationship.

The following points were made as observations or recommendations in the course of the meeting.

1. The family was seen as the central focus in both the prevention and in the management of cannabis-induced emotional and cognitive disorders of children. In some instances a reorientation of the entire family constellation is needed to insure drug-abstinent behavior on the part of the patient.

2. The consciousness of health care professionals in contact with adolescent patients should be raised about the possible role of cannabis in some of their patients' behavioral problems.

3. The issue of the personality/cannabis interaction requires further study. It is possible that young people with a low frustration tolerance, a lesser capacity to cope with stress,

and with inadequate psychosocial development are more likely to become overinvolved with a drug like cannabis. This is so because it transiently resolves frustrations, stresses, and feelings of inadequacy. A certain amount of self-treatment of depression and anxiety with cannabis goes on. On the other hand, it appears that psychologically sound young people from stable and loving families have become chronic, high-dose users. Peer influences can sometimes exceed family influences.

4. The question of why adolescents should be more vulnerable than adults to the psychic effects of marijuana was raised. During the early teens the adolescent is dealing with problems of identity, separation from parental ties, psychosexual readjustment, and a loss of childhood gratifications. During this phase of reorientation and tumult, a drug like cannabis that interferes with memory, learning, and emotion can cause a disorganization of the psychological restructuring process.

5. The prevention of marijuana use by adolescents should be approached on an individual, familial, and national basis. The essential elements of information needed by children for making decisions about marijuana should be presented with improved educational techniques. Parental limit setting and example setting are essential components of a prevention strategy. Supply reduction at the source or during large-scale movements of the drug should be continued and improved.

6. High-quality, controlled clinical research should be designed to determine the incidence and precise nature of the cannabis brain syndromes. Such impartial studies should be capable of providing answers to real-life issues involving the growing child and cannabis.

7. The public health messages relating to cannabis and youth received careful attention, but without unanimous resolution. A majority felt that a tough, unambiguous, simple message would be most effective. The minority believed that it was not possible to accurately simplify such statements while retaining scientific integrity. The hazards of distortion following the release of scientific data into the information environment were discussed.

8. A very preliminary mention of two cases of a possible fetal cannabis syndrome was presented.

Many other important points were made, and these are to be found in the papers themselves and in the discussions. Clinical reports such as these can have great value in pointing out impressions gathered during experiences with patients. Many advances in medical knowledge have derived from such observations. The presumed impact of marijuana on the psychological development of the young person appears firmly established but should be further confirmed by carefully conceived studies.

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